Instrument Interface
Installation Guide

ABX Pentra 60

Based upon
Instrument Software Version 1.05
Sunquest Laboratory™ Software Versions 5.3, 5.4.2, 6.1 and 6.2
micros_driver Version 1.06

Instrument Interface Installation Guide

Revision Record

Date	Revision	Summary of Change w/ Page Number
02/14/01	1.0	Baseline Document
01/17/02	1.1	Add Sunquest trademark
03/26/02	1.2	Add address
06/21/02	1.3	Add template, update driver (title page)
09/20/02	1.4	Correct company name (pg. 2)
06/13/03	1.5	Migrate to 5.3
05/06/05	1.6	Re-templated and added/modified Instrument Software Settings (Sec. 4)
10/17/07	1.7	Re-brand document

DISCLAIMER

This document has been prepared by Sunquest Information Systems as a service to our clients. It is intended as a guide to our clients for the setup of the instrument settings necessary to implement an instrument interface with Sunquest's products. The information contained herein should not be considered exhaustive, appropriate, or applicable for all installations. The information in this guide should only be applied and used in your environment after you have carefully reviewed the regulatory requirements applicable to your internal policies and procedures as applicable to the instrument interface.

Additionally, note that this document must be used in conjunction with the instrument vendor's current operator and interface documentation. It is the client's responsibility to validate the interface upon installation and subsequent to any software, hardware, or setting modifications made by the instrument vendor, Sunquest, and/or the client.

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Section 1: Overview

The purpose of this document is to aid in the interfacing of the given instrument to Sunquest Laboratory™. The document lists *recommended* instrument settings, interfacing maintenance, and gives a general description of the hardware and software requirements to interface the instrument to Sunquest Laboratory.

Section 2: General Information

Uploadable?	Yes
Downloadable?	No
Dynamic Download?	No
Solicited Dynamic (Host Query)?	No

Section 3: Instrument Hardware Description

This is typically a DTE instrument that requires an RS-232 cable terminated with an RJ-45 connector.

> **Note** Because some instruments have non-standard I/O board configurations, the use of a data-tracker (or DB-9 Pocketester) may be required to determine the DTE/DCE nature of the device. (For assistance, refer to the DB-25 or DB-9 troubleshooting sections of the *Instrument Interfacing Cabling Guide* located online.)

If the instrument has a DB-25 port, then a “DB-25 to RJ-45” modular adapter will be used to facilitate communications. If the instrument has a DB-9 port, there are two options:

- A “DB-9 to DB-25” converter may be used to convert the communications port to a DB-25; after which a “DB-25 to RJ-45” modular adapter may be used.
- A “DB-9 to RJ-45” modular adapter is used to establish communications.

Section 4: Instrument Software Settings

Baud Rate*	9600	Stop Bits*	1
Data Bits*	8	Parity*	None

*__Note__ Use manufacturer’s suggested settings if different from stated here. Also note that server port settings must match the instrument’s set up.

1) From the Main Menu, CLICK option 5, SETUP

2) From the SETUP Menu, CLICK Option number 4, RS232 (A vendor password is necessary here. If you do not have a vendor password enter 123 as the default password)

3) From the SETUP\RS232 Menu, CHOOSE option number 1, RS232 CONFIGURATION

4) At the SETUP\RS232\CONFIGURATION Menu, SET the following:

Baud	9600
Stop Bits	1
Length	8
Parity	None
Protocol	None
Mode	Bi-directional
Format	ABX
CRC Check	Check
SDH-EDH	Check
Timeout	120
Waiting Time	60
Automatic Disconnection	Check
Term to Disconnection	25
Reject Same Files	Check

5) Go back to SETUP/RS232 Menu and CHOOSE option 2, SENDING CONFIGURATION

6) In the SETUP\RS232\SENDING CONFIGURATION Menu, SET the following:

ABX	(click in box)
UNIDIR	(click in box)
TIMEOUT	15
WORKS SEPARATOR	:

7) Go back to the SETUP\RS232 menu, CHOOSE option 3, ABX FORMAT

8) Under the SETUP\RS232\ABX FORMAT menu, CHOOSE option 1, NUMERICAL RESULTS. Boxes are marked with periods, default to all results.

9) Back at the SETUP\RS232\ABX FORMAT menu, CHOOSE option 2, FLAGS AND PATHOLOGIES. Leave all options marked.

10) Under the SETUP\RS232\ABX FORMAT menu, CHOOSE option 3, HISTOGRAMS AND THRESHOLDS. Remove all of the periods.

11) Under the SETUP\RS232\ABX FORMAT menu, CHOOSE option 4, PATIENT FILE. Leave all options marked.

12) Back at the SETUP\RS232\ABX FORMAT menu, CHOOSE option 5, RAW DATA. Remove all of the periods in the boxes.

Section 5: Example of SCAN IX Data

89 [90] AABXRI\sq!085#kid!Kernel_I_T52#inst!01#seq!0060#an!040033012#ts!
WBC#tr!01.61#rf! #rf!L#ts!LYMPH1#tr!00.87#rf! #rf!l#ts!LYMPH2#tr!53.70#rf! #rf!h
#ts!MONO1#tr!00.08#rf! #rf!l#ts!MONO2#tr!04.80#rf! #rf! #ts!NEUT1#tr!00.61#rf! #
rf!L#ts!NEUT2#tr!37.80#rf! #rf!L#~9:39:58~9:40:1
90 [91] AABXRI\sq!085#ts!EOSI1#tr!00.04#rf! #rf! #ts!EOSI2#tr!02.60#rf!
#rf! #ts!BASO1#tr!00.02#rf! #rf! #ts!BASO2#tr!01.10#rf! #rf! #ts!ALYMP1#tr!00.06
#rf! #rf! #ts!ALYMP2#tr!03.49#rf! #rf!h#ts!LARGE1#tr!00.01#rf! #rf! #ts!LARGE2#t
r!00.82#rf! #rf! #ts!RBC#~9:39:58~9:40:1
91 [92] AABXRI\sq!085#tr!04.15#rf! #rf! #ts!HGB#tr!13.91#rf! #rf! #ts!HC
T#tr!39.88#rf! #rf! #ts!MCV#tr!96.11#rf! #rf! #ts!MCH#tr!33.53#rf! #rf! #ts!MCHC
#tr!34.89#rf! #rf! #ts!RDW#tr!19.42#rf! #rf! #ts!PLT#tr!00076#rf! #rf!l#ts!MPV#t
r!08.58#rf! #rf! #ts!THT#~9:39:58~9:40:1
92 [93] AABXRI\sq!085#tr!0.066#rf! #rf!L#ts!PDW#tr!15.75#rf! #rf! #ts!DI
FF#tr!0#ts!FLGWBC#tr!0#ts!FLGRBC#tr!0#ts!FLGPLT#tr!0#ts!WBCBAA#tr!0#ts!
GENERAL#tr!0#ts!WBCPARM#tr!1#rf!LEU-#rf!NEU-drdate!25012001#drtime!093
95724#\##~9:39:58~9:40:1

Section 6: Instrument-Specific Maintenance

- **Define the method code using function MA, option 4 (English Text Definition).**

- **Add instrument to Instrument Table using function IX (^IX3)**

  Option 1. Instrument Interface Maintenance
  Sub-Option 2. Method Level Definitions
  Sub-Option 1. Instrument Table Definitions
  Enter the Method Code.

  DEFINE INSTRUMENT TABLE
  Method Code: METHOD

  1. IX Program <^IX0> : ^IX0
  2. Subsystem : << site specific* >>

  If you have the Sunquest Instrument Manager™, you may also see the following prompts – they should be set up by your installer.

  3. Port id : << tcp:*servername*:*port* >>**
  4. Driver name : << see title page for correct driver >>
  5. INIT data : << instrument specific – ask installer >>
  6. WIRETAP on <N>/Y : N
  7. Permanent <Y>/N : Y << this adds the setup to your permanent startup file >>
  8. Redownload <N>/Y : N

  Accept (A), Modify (M) or Reject (R)

*To determine the correct subsystem, use ?? at the method code prompt to see the kernel subsystems currently defined.
Do not enter an invalid server name as it may adversely affect kernel communications.

- **Instrument – Specific Definitions using function IX (^IX3)**

  Option 1. Instrument Interface Maintenance
  Sub-Option 2. Method Level Definition
  Sub-Options 2. Instrument – Specific Definitions
  Enter Method Code and the following settings.

DEVICE SPECIFIC DEFINITIONS FOR METHOD *** METHOD ***

1. File by (?? to list options)	: Sequence [1]
2. Automatic File Cleanup? (Y/<N>)	: N
3. Pattern Match For Results (<1>-7)	: 1 = .1"."1N.N.1".".N [2]
4. Round or Truncate Results (<R>/T)	: R
5. Collate Results into One Cup (Y/<N>)	: Y
a. Increment cup on repeat of test (Y/<N>)	: Y
b. Collation timer (<0>/n)	: << instrument specific >>
6. Delete Previously Accepted Results (<Y>/N)	: Y
7. Global Flags for Errors (<N>/Y)	: N
8. Instrument Format	:
9. Calculation Worksheet Name	: <<site specific>>
10. Symbol to File for Errors <???>	: ???
11. Downloadable Instrument (Y/<N>)	: N
12. Lab Location	:
13. Accession Number Format (<1>-2)	: 1 [3]
a. Accession Number Translations	: 1=X,2=M,3=T,4=W,5=H,6=F,7=S
14. Keep Data Appended to Acc. Number (<Y>/N)	: Y
15. Instrument is Activated/Deactivated (<A>/D)	: Activated
16. File appended text to LAB file (<Y>/N)	: Y

[1]File by S is suggested by Sunquest because it has less risk of combining or overwriting results. Filing by anything sent from the instrument requires strict procedures on OFCing. See the Sunquest Laboratory *Instrument Interface Administrator's Guide* for details.

[2] Pattern match of 1 is recommended for all instruments that have *mostly* or *all* numeric result expectations. Pattern match of 6 is only to be used on instruments that have *all* alphabetic result expectations. If you have an instrument that may have a few alphabetic results among mostly numeric values, use test-specific definitions in IX (^IX3) option 1, sub-option. 3, sub-option. 2 to set *only* alphabetic result tests to pattern match of 6 while leaving device-level definitions at 1.

[3] If CPU is linked, then item #13, format 2 could be required. Example of format 2 accession number translations are 10=X, 11=M, 12=T. C must translate to 20 (20=C).

- **Device-Level Hook Table**

  Accept the Preprocessor Table Definitions in function IX (^IX3)
  Option 1. Instrument Interface Maintenance
  Sub-Option 2. Method Level Definitions
  Sub-Option 3. Instrument Processor Table Definitions
  Enter your Method Code.

  Process Table Definition:

  FSQ#\GAQ^IXW0P5#\EM#\RES^IXW0P3A#\COL#\GMG#\WD#
  Accept (A), Modify (M), or Reject (R): A

  - Additional Hooks (Not Applicable)

- **Test-Level Upload Hook Programs** (Not Applicable)

- **Preprocessing Maintenance and Control**

    - Function IX (^IX3) option 1, sub-option 4, Preprocessing Maintenance, sub-option 1 Device-Level Criteria. If not yet autofiling or using LARS, preprocessing is still valuable to troubleshooting in the future.

    Set up Preprocessing Maintenance by taking all "No" answers where available and default the others where "N" is not an option.

    1. Autofile Y/N: N
       a. Autofile to LAB Y/N: N
       b. Autofile to HOLD Y/N: N
       c. Autofile to PRELIM Y/N: N
    2. Direct Releasable Results to: N
    3. Direct Non-releasable Results to: N etc.

    - Then you *must* use function IX (^IX3) option 15 Preprocessing Control, sub-option 1 to Enable Preprocessing.

- **Reset the Results Processor** using the function IX (^IX3) option 9 (Reset Instrument Interface – Y on second prompt) or IXC (^IX4C) option 2 (Y on second prompt).

Section 7: Online String Maintenance

- Define tests that are part of an online string using function MA option 1 (Test/ Battery/ Package Definition).

    - Add tests to the online string using function IX (^IX3)
      Option 1. Instrument Interface Maintenance
      Sub-Option 3. Test Level Definitions
      Sub-Option 1. Online String Definitions

    - Define test-specific definitions as required using function IX (^IX3)
      Option 1. Instrument Interface Maintenance
      Sub-Option 3. Test Level Definitions
      Sub-Option 2. Test Specific Definitions (See note regarding pattern match in Section 6)

Analyte (Test)	Upload Code	Analyte (Test)	Upload Code
WBC	WBC	Absolute LYMPH	LYMPH1
RBC	RBC	Absolute MONO	MONO1
HGB	HGB	Absolute EOSIN	EOSI1
HCT	HCT	Absolute BASO	BASO1
MCV	MCV	%NEUT	NEUT2
MCH	MCH	%LYMPH	LYMPH2
MCHC	MCHC	%MONO	MONO2
RDW	RDW	%EOSIN	EOSI2
PLT	PLT	%BASO	BASO2
Absolute NEUT	NEUT1		

Note This list is complete, as far as we know. There may be other tests, with other upload codes that we have not included here. If you use a test that is not included on this list, check the reagent package or information insert in the reagent package for the test name. If you cannot find it that way, manually run and upload a test from the instrument. In SCAN-IX, the upload code will appear in the space: "ts!(upload code)." Confirm manufacturer is approved for release of these result codes.

- If an online calculation worksheet is to be used, define the calculation worksheet using function MA options 3 (Worksheet Definition) and 21 (Calculation Definition). Install online calculation worksheet name in function IX (^IX3) option 1, sub-option 2, sub-option 2.

- Print a copy of the online string for future reference using function IXR option 1 (General Instrument Setup) sub-options 4 (Online String Definitions) and 5 (Test Specific Definitions).

- Reset the Results Processor using the function IX (^IX3) option 9 (Reset Instrument Interface – Y *only* at second prompt) or IXC (^IX4C) option 2 (Y *only* on second prompt).

Section 8: Result Flag Maintenance

Result flags can be used to handle additional information about result analysis. SCAN IX will display result flags in the `rf!` fields, if available. These should be investigated before allowing batched result releasing based upon Preprocessing Criteria (LARS and Autofiling).
Some instruments do not send them.

Information on this section is not yet available

Section 9: Download Maintenance

Not Applicable

Section 10: Resetting and Activating Processors

- Results Processor: Using function IX (^IX3): Option 9 (*Reset* Instrument Interface – Y *only* on the second prompt) or IXC (^IX4C): Option 2 (Y *only* on the second prompt).

    RESET THE INSTRUMENT INTERFACE

    Confirm Resetting the Network Instrument Interface (Y/<N>) **No (see note)**
    Confirm Resetting the IX Results Processor (Y/<N>) **Yes**

    Resetting Results Processor for IXW0P...
    Reset request acknowledged.
    Wait for completion, or press any key to continue.....Reset complete

The resetting/stopping of IX0 in function IX (^IX3) *INSTRUMENT INTERFACE RESET/STOP* (option 9 /10) is *not recommended* for any changes you make. Under this option, there are two prompts – one to reset/stop *NETWORK INSTRUMENT INTERFACE* – type NO at this prompt. The next prompt to reset/stop *RESULTS PROCESSOR* is allowable anytime.

Section 11: Additional Comments

For additional information about instrument maintenance, see the Sunquest Laboratory *Instrument Interface Administrator's Guide*.

Most functions mentioned in this document have a routine reference. Your functions may not match the routine we reference. You can add the function or change your function's routine to match ours in function SC. Also, function IX is usually broken-up into IXM and IXC, which are widely available with varying security levels.