BK PRECISION®

**Model: 732A, 735**

# Digital Sound Level Meter

**USER MANUAL**

# CONTENTS

Title Page


I. SAFETY INFORMATION……..…….. 1
Environment conditions……....1
Maintenance & Clearing……1
Safety symbols…… 1

II. GENERAL DESCRIPTION……..……..2

III. SPECIFICATIONS..……..……..2

IV. NAME AND FUNCTIONS..……..5

V. CLOCK & INTV SETUP……6
DataLogger…….. 6
Clock Setup……..6
Recording Interval Setup……7
Auto Power Off……7

VI. CALIBRATION PROCEDURES……..7

VII . MEASUREMENT PREPARATION……..8

VIII. OPERATING PRECAUTIONS……..8

IX. MEASUREMENT……..…9

X. Setup TestLink AK-73X (Sound Level Meter)—
RS232 interface software……..9

# I. SAFETY INFORMATION

Read the following safety information carefully before attempting to operate or service the meter.

Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

## Environment conditions

- Altitude up to 2000 meters
- Relatively humidity 90% max.
- Operation Ambient 0° ~ 40°C

## Maintenance & Clearing

- Repairs or servicing not covered in this manual should only be performed by qualified personnel.
- Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on this instruments.

## Safety symbols

CE **Comply with EMC**

When servicing, use only specified replacement parts.

# II. GENERAL DESCRIPTION

Thank you for using our Data Logger Sound Level Meter. To ensure that you can get the most from it, we recommend that you read and follow the manual carefully before use.

This unit conforms to the IEC651 type2, ANSI S1.4 Type2 for Sound Level Meters.

This Data Logger Sound Level Meter internal memory can keep up to 32000 records.

(Note 1.)

It uses RS232 interface to perform bi-directional communication with PC.

**Note1 (model 735):**

Press “REC” to begin recording, press “REC” again to stop recording. The data will be loaded into the memory until it is full.

## III. SPECIFICATIONS

Frequency range: 31.5Hz ~ 8KHz
Measuring level range: 30 ~ 130dB
Frequency weighting: A / C
Microphone: 1/2 inch electret condenser microphone
Display: LCD
Digital display: 4 digits

Resolution: 0.1dB
Display Update: 0.5 sec.
Analog display: 50 segment bargraph
Resolution: 1dB
Display Update: 50 mS
Time weighting: FAST (125mS), SLOW (1 sec.)
Level ranges: Lo: 30 – 80 dB
Med: 50 – 100 dB
Hi: 80 – 130 dB
Auto: 30 – 130 dB
Accuracy: ±1.5dB (under reference conditions @ 94dB, 1KHz)
Dynamic range: 100 dB (50 dB model 732A)
Alarm function: “OVER” is when input is more than the upper limit of range.
“ UNDER ” is when input is less than the lower limit of range.
MAX/MIN hold: Holds readings the Maximum and Minimum Value.
AC output: 1 Vrms at FS (full scale).
Output impedance: Approx. 100Ω
FS: means the upper limit of each level range.
DC output: 10mV / dB, output impedance approx. 1KΩ
Power supply: One 9V battery, 006P or IEC 6F22 or NEDA 1604.
Power life: About 50hrs (alkaline battery)
AC adapter: Voltage 9 VDC, center pin negative, (8-15VDC Max)
Supply current : > 30mADC Socket : pin → Ground
Casing → Positive External Diameter → 3.5mm
Internal Diameter → 1.35mm

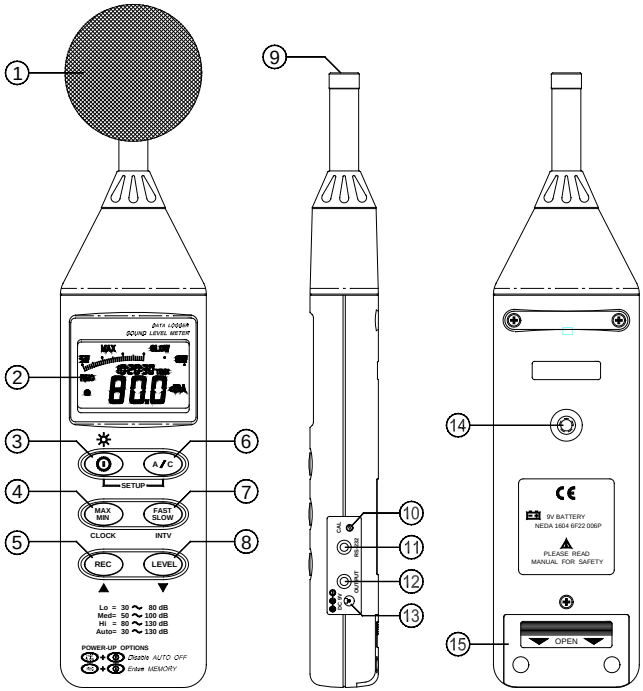
Electromagnetic Compatibility:
RF field = 3V/m

Total accuracy = specified accuracy + 0.5dB
Operation temperature: 0 to 40°C (32° to 104°F)
Operation humidity: 10° to 90%RH
Storage temperature: -10° to 60°C (14° to 140°F)
Storage humidity: 10 to 75%RH
Dimensions (L x W x H): 10.8 × 2.5 × 1.2inch (275 × 64 × 30mm)

Weight: 285g (including battery)
Accessories: 9V battery, carrying case, Screwdriver, Instruction manual. Windscreen, 3.5 $\phi$ plug, software & RS-232 cable (optional model 732A).

Specifications and information subject to change without notice. Please visit www.bkprecision.com for the most current product information.

## IV. NAME AND FUNCTIONS



① **Windscreen**

If you operate at wind speed over 10m/sec, please put protective accessories in front of the microphone.

② **Display**




| ***SYMBOL*** | ***FUNCTION*** |
|---|---|
| LCD | 4 digits |
| MAX | Maximum indication |
| MIN | Minimum indication |
| OVER | Over range |
| UNDER | Under range |
| FAST | Fast response |
| SLOW | Slow response |
| dBA | A-Weighting |
| dBC | C-Weighting |
| 88 - 180 | Range Indicate |
| | Low-Battery |
| -LO- | Under range 20dB |
| Following items for model 735 | |
| AUTO | Auto Level range selective |
| REC | Recording Datalogger |
| FULL | Memory full |
| | Auto Power OFF active |

③ **Power & Backlight button**

The ⏻ key turns the sound level meter ON or OFF and backlight ON & OFF.

Press it once to turn on the sound level meter.

Press it again for moment to turn ON or OFF backlight.

Press and hold this button 3 seconds to turn the unit OFF.

**Note:** When the user powers it on, the LCD will show how much memory space

is available to use (model 735).

**④ MAX / MIN hold button**

Press (MAX MIN) button to enter the maximum and minimum recording mode. Select the proper Level range before using MAX/MIN to ensure that reading value will not exceed the measurement range. Press once to select MAX value. Press again to select MIN value, and press again to select current value with " MAX MIN " annunciator will begin to blink.

Press (MAX MIN) and hold down button for 2 seconds to exit the MAX MIN mode.

**Note:** If you change sound level range or change A-C weight, the MAX.MIN mode will clear.

**⑤ Record Datalogger button (model 735)**

When you press the (REC) button, the meter will begin recording. The "REC" annunciator will be displayed, press again and it will stop recording.

**⑥ Frequency Weighting select button**

A: A - Weighting. Used for general sound level measurements.

C: C - Weighting. Used for checking the low-frequency content of noise.

(If the C-Weighted level is much higher than the A-weighted level, then there is a large amount of low-frequency noise)

**⑦ Time weighting select button**

FAST: for normal measurements

SLOW: for checking average level of fluctuating noise.

**⑧ Level range control button**

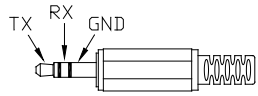
Each time you press the (LEVEL) button, the level range will change between "Lo" level, "Med" level, "Hi" level and "Auto" level.

**⑨ Microphone**

1/2 inch Electret Condenser microphone

**⑩ CAL potentiometer**

Is used for calibration adjustment.




**⑪ RS-232 Interface:**

The RS-232 signal output is a 9600 bps N 8 1 serial interface.

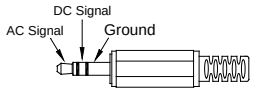
⑫ **Signal output terminal**

**AC:** 1 Vrms Corresponding to each range step.

Output impedance ≒ 100Ω

Output signal by standard 3.5mm coaxial socket signal.

**Note:** At "Auto" level range, output signal is Auto select on "Lo" or "Med" or "Hi" level range.




**DC:** Output: 10mV/dB

Output impedance = 1KΩ

The output signal is sent by standard 3.5mm coaxial socket signal.

⑬ **External DC 9V power supply terminal**

Allows for an external AC adapter.

⑭ **Tripod mounting screw.**

⑮ **Battery Cover**

## V. DATA LOGGER CLOCK & INTERVAL SETUP

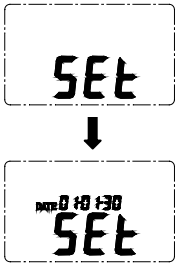
(Model 735 Only)

- **DataLogger:**

When you press the "REC" button, the meter will begin recording, and pressing the "REC" button again will stop recording, If you want to clear the memory, power off the meter, then press and hold the "REC" button and then press power button and hold it for at least 5 seconds, then LCD will show "CLR" and "SURE" to clear the memory.




- **Clock Setup:**

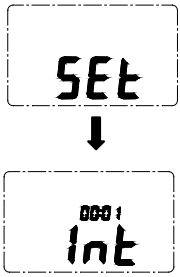



1: press and hold the "**A/C**" button and then power on the meter:

2: press "**MAX MIN**"(clock) button:

3: press "**REC**" ▲ or "**LEVEL**" ▼ to increase or decrease number, press "**MAX MIN**"(clock) to adjust next item. The adjusting order is year→month→day→hour→minute, then press "**MAX MIN**" (clock) to finish adjusting. If you want to abort during a setup process, press power button to cancel.

- **Recording Interval Setup:**




1: Press and hold the "**A/C**" button and then power on the meter:

2: Press "**FAST/SLOW**"(INTV) button:

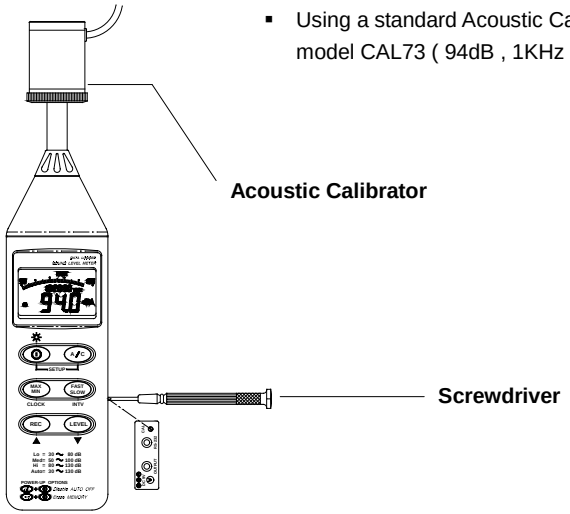
3: Press "**REC**" ▲ or "**LEVEL**" ▼ to increase or decrease number, press "**FAST/SLOW** " (INTV) to adjust next item, then press "**FAST/SLOW**" (INTV) to finish. If you want to abort during a setup process, press the power button to cancel.

- **Auto Power Off:**

When the meter is turned on the default auto power off is enabled. The meter will power itself off after 30 minutes if no keys are pressed and no RS232 communication is established.

To disable the auto power off feature, press and hold the "**FAST/SLOW**" button while using the on/off button to turn the unit on. Once this is done you will no longer see the symbol on the display.

## VI. CALIBRATION PROCEDURES




- Using a standard Acoustic Calibrator B&K model CAL73 ( 94dB , 1KHz Sine wave )

(1) Make the following switch settings.
Display: dBA

Time weighting: FAST
Measurement mode: MAX MIN Mode function disable.
Level range: 50 to 100dB

(2) Insert the microphone housing carefully into the insertion hole of the calibrator.

(3) Turn on the switch of calibrator and adjust the CAL potentiometer of the unit. The level display will indicate the desired level .
All products are well calibrated before shipment.
Recommended Recalibration cycle : 1 year.

## VII. MEASUREMENT PREPARATION

**(1) Battery Loading**

Remove the battery cover on the back and put in one 9V Battery.

**(2) Battery Replacement**

When the battery voltage drops below the operating voltage, this symbol will appear  replace 9 Volt battery.

**(3) AC Adapter Connection**

When the AC adapter is used, insert the plugs of the adapter into the DC 9V connector on the side panel.

## VIII. OPERATING PRECAUTIONS

(1) Wind blowing across the microphone would bring additional noise.
When using the instrument in the presence of wind, always use the windscreen to eliminate unwanted noise.

(2) Calibrate the instrument before operation if the instrument was not in use for a long period of time.

(3) Do not store or operate the instrument at high temperature and high humidity environment.

(4) Keep the microphone dry and avoid severe vibration.

(5) Please take out the battery and keep the instrument in a low humidity environment when not in use.

## IX. MEASUREMENT

(1) Open battery cover and install a 9V battery in the battery compartment.

(2) Turn power on and select the desired response Time and Weighting. If the sound source consists of short bursts or only catching sound peak, set

response to FAST. To measure average sound level, use the SLOW setting. Select A-weighting for general noise sound level and C-weighting for measuring sound level of acoustic material.

(3) Select desired Level.

(4) Hold the instrument comfortably in hand or fix on tripod and point the microphone at the suspected noise source, the sound pressure level will be displayed.

(5) When MAX MIN (maximum, minimum hold) mode is chosen. The instrument captures and holds the maximum and minimum noise level for a long period using any of the time weightings and ranges.
Press the MAX MIN button 2 seconds to clear the MAX/MIN reading. " MAX/MIN " symbol disappears.

(6) Turn OFF the instrument and remove battery when not in use.

## X. Setup TestLink AK-73X (Sound Level Meter)—RS232 interface software (included with model 735):

- **The TestLink package contains:**
  1.80mm CD.
  2.Custom designed RS232 cable for TestLink.
- **System Required:**
  Windows 95, Windows 98, or Windows NT 4.0 above.
- **Minimum Hardware Required:**
  PC or Notebook with Pentium 90MHz or higher, 32 MB RAM ;
  At least 5 MB byte hard disk space available to install TestLink. Recommended resolution 800X600.

- **Install TestLink:**

  1.We recommend closing all other applications before installing the TestLink.
  2.Insert setup CD disk to CD disk drive.
  3.Choose the Start button on the Taskbar and select Run.
  4.Type E:\SETUP and choose OK, then it will copy AK73X.exe (executable file) and help file to your hard disk (default is c:\program files\TestLink\AK73X).

  For detailed other operation instruction, please refer to the online help while executing AK73X.

- **Main Menu**

  **File |** Open- Retrieve files from the disk.

  **Save -** Save the active window (when the caption bar is highlighted) data to the disk.

  **Print -** Print the data of the active window (graph or list).

  **Printer Setup -** Select printer.

  **File | Exit:** Terminates TestLink program.

  **View | Control Panel:** By opening the Panel Window, the user can control the meter via the button in this window.

  **View | Real-Time Graph:** Open Real-Time Graph to display and graph the present data.

  **Real Time Data | Run -** Start collecting real time data.

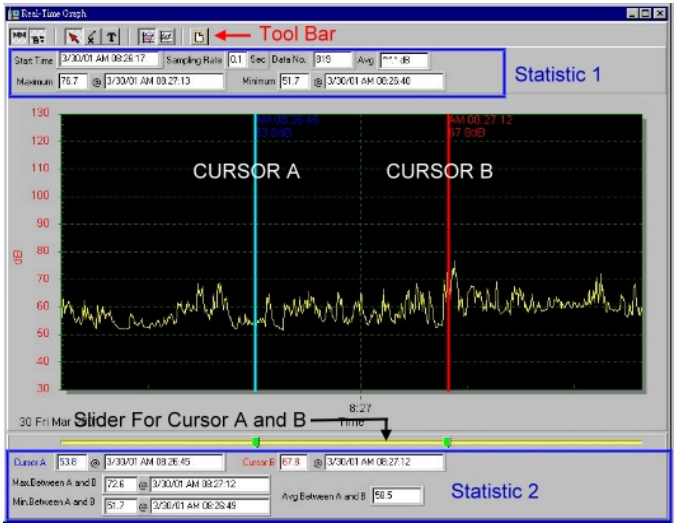
  **Stop -** Stop collecting real time data.

  **DataLogger:** By opening the DataLogger Window, the user can load recorded data from the meter to the PC in this window.

  **Output To Graph -** Graphing tabular data.

Interface. For better result, the user may close the panel window.

## Graph




## Tool Bar

 - Display or hide Statistic1.

 - Display or hide Statistic2.

 - Normal cursor.

 - When selected, the mouse cursor will become a cross sign when moving to the graph, click on the graph to mark a cross sign on the graph.

 - When selected, the mouse cursor will become an "I" sign when moving to the graph, click on the graph to annotate.

 - Color graph.

 - Monochrome graph.

You can choose a rectangle area on the graph to zoom in for detail.
There are two vertical lines (CURSOR A and CURSOR B) in the graph. There are

time and value display on top and right side of each cursor. You can move the mouse cursor over cursor A or B and click to drag the cursor to move left or right. Right below the cursor A and B is a slider. You can also click and drag slider to move cursor A or B. Below the slider is the statistic, it displays start time, sampling rate, data number, maximum and minimum of the graph. The statistic also displays the maximum, minimum and average between cursor A and B and these data will update automatically when cursor A or B is moving.
You can double click the graph to call the option dialog. The option dialog, allowed you to customize your graph style.
And you can right click the graph (real time graph is not allowed) to call out the popup menu.

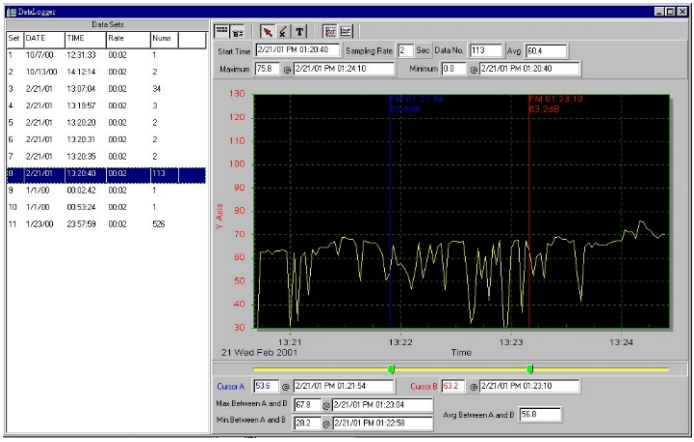
You can Zoom this graph by using mouse:

To Zoom:

1. Press the left mouse button and drag the cursor to select the new extents.
2. Release the mouse button.

To Undo the Zoom - Right click on the graph, there will be a pop-up menu, select Undo Zoom .

**DataLogger**



When you have the Sound Level DATA LOGGER meter connected to PC and select "DataLogger" from main menu or click f tool bar to load recorded data from the meter and there will be a progress indicator to show the loading progress. if an error occurs, just click "DataLogger" again.

After the data is loaded, the left hand side will show how many data sets were loaded and detail information for each data set (start data, start time, recording rate and record numbers).

For examples:

Data Sets

| Set | DATE | TIME | Rate | Nums |
|---|---|---|---|---|
| 1 | 1999/7/25 | PM 01:24:52 | 00:02 | 10 |
| 2 | 1999/7/25 | PM 01:25:38 | 00:02 | 5142 |
| 3 | 1999/7/25 | PM 09:29:08 | 00:02 | 21 |
| 4 | 1999/7/25 | PM 09:32:04 | 00:02 | 3 |
| 5 | 1999/7/25 | PM 09:32:09 | 00:02 | 1 |
| 6 | 1999/7/25 | PM 09:32:14 | 00:02 | 9 |
| 7 | 1999/7/25 | PM 10:03:43 | 00:02 | 1896 |
| 8 | 1999/7/25 | PM 11:06:57 | 00:02 | 3 |
| 9 | 1999/7/25 | PM 11:49:47 | 00:02 | 9086 |

It will transfer data to a graph and tabular on the right hand side every time after you load recorded data from the Sound Level Meter and you can click at any data set to change the set for graph.

On the right hand side is the waveform graph and statistic of the data set you choose.

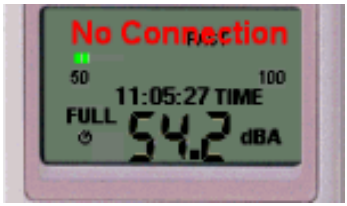
## ▪ Tutorial - Quick Start to Use AK-73X TestLink

**(1.) Recording real time data in waveform.**

1.Power on the Sound Level Meter first and connect it to a PC via the RS-232 serial port with the cable (SE-300)

2.Start AK-73X program.

3.If the connection is successful the panel will display the same value as the Sound Level Meter. If it failed to connect the meter with the PC, it will display "No Connection" on the panel window in TestLink AK –73X.

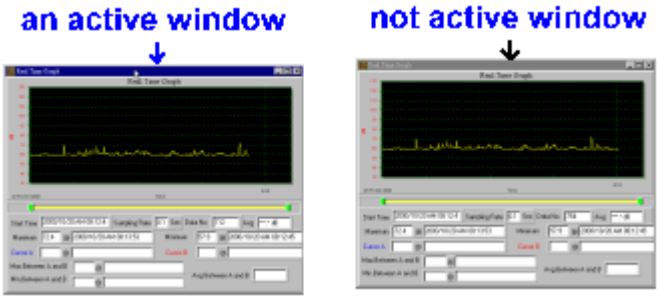



4.When the connection is successful, click to start recording real time data and there will be a waveform on the Real Time Graph Window.

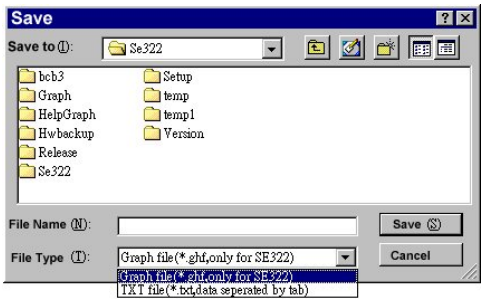
5.Click to start recording.

**(2.) How to save the recorded real time data to a file?**

1.Click on the graph window you want to save and the graph window will become active, then choose File | Save from main menu or click from the tool bar.

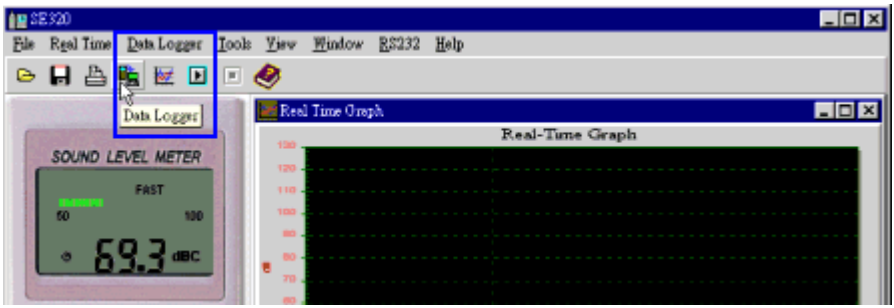



2. There will be a save dialog window for you to choose the file name and file type to save. There are three types of file names you can choose, binary file (*.ghf), text file (*.txt) and EXCEL format file (*.csv). The *.ghf file use much fewer disk space to save the data than the other two file format, but it can only be used in TestLink AK-73X. Text file can be opened by TestLink AK-73X and any other word processor program like word, notepad etc. EXCEL format file can be opened by TestLink AK-73X and Microsoft EXCEL.




**(3.) How to load the recorded data from the memory of Sound Level Meter and save it to a file ?**
**(Only for the model with Data Logger)**

1. Power on the Sound Level Meter.
2. Press the REC button of the meter to start recording data.
3. After a while, press REC button again to stop recording data.
4. Connect the Sound Level Meter to PC
5. Start AK-73X program.
6. Choose Data Logger from main menu or click  from tool bar.




7.In reference to Data Logger, see DataLogger.

## ▪ Frequently Asked Question

**1. I had connected the Sound Level Meter to PC serial port and turned the meter on, but it still shows "NO CONNECTION".**

**Answer:** It could be that all serial port are occupied by other application, close all other application. If it still don't work. Restart your computer and run TestLink AK-73X again.

**2. How can I save the graph to a file, which can be used in EXCEL?**

**Answer:** When you save a graph to a file, the default file format is "*.ghf" and you can select *.csv to save files. CSV is an EXCEL file format you can open in EXCEL.

**3. How to uninstall TestLink AK-73X?**

**Answer:** Uninstall TestLink AK-73X by launching the Add/Remove Programs applet out of the Control Panel, highlighting the AK-73X, and clicking on the Add/Remove icon, then it will remove the AK-73X folder and files from your computer.

**4. Why would loading data fail?**

**Answer:** This might be caused by the slow response from some of the notebook PC system.

**5. How to zoom in on the graph?**

**Answer:** Press the left mouse button and drag the cursor to select the new extents, and then release the mouse button.

**6. When I setup the real time sampling with a fast rate (e.g. 0.1 sec), some of the sampling data might be missing.**

**Answer:** This might be caused by slow response time of the PC.

## Limited One-Year Warranty

B&K Precision Corp. warrants to the original purchaser that its products and the component parts thereof, will be free from defects in workmanship and materials for a period of one year from date of purchase.

B&K Precision Corp. will, without charge, repair or replace, at its option, defective product or component parts. Returned product must be accompanied by proof of the purchase date in the form of a sales receipt.

To obtain warranty coverage in the U.S.A., this product must be registered by completing a warranty registration form on www.bkprecision.com within fifteen (15) days of purchase.

**Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. The warranty is void if the serial number is altered, defaced or removed.**

B&K Precision Corp. shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages. So the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may have other rights, which vary from state-to-state.

B&K Precision Corp.
22820 Savi Ranch Parkway
Yorba Linda, CA 92887
www.bkprecision.com
714-921-9095

## Service Information

**Warranty Service:** Please return the product in the original packaging with proof of purchase to the address below. Clearly state in writing the performance problem and return any leads, probes, connectors and accessories that you are using with the device.

**Non-Warranty Service:** Return the product in the original packaging to the address below. Clearly state in writing the performance problem and return any leads, probes, connectors and accessories that you are using with the device. Customers not on open account must include payment in the form of a money order or credit card. For the most current repair charges please visit www.bkprecision.com and click on "service/repair".

Return all merchandise to B&K Precision Corp. with pre-paid shipping. The flat-rate repair charge for Non-Warranty Service does not include return shipping. Return shipping to locations in North American is included for Warranty Service. For overnight shipments and non-North American shipping fees please contact B&K Precision Corp.

B&K Precision Corp.
22820 Savi Ranch Parkway
Yorba Linda, CA 92887
www.bkprecision.com
714-921-9095

**Include with the returned instrument your complete return shipping address, contact name, phone number and description of problem.**