# Table of Contents (Win 98/me Version)

## Item Checklist (LA-2124)

1) The LA-2124 Plastic unit.
2) Color wires and E-Z Hook clips X 30.
3) D-Sub 25 Pin Cable 125 CM (Male ⇔ Female) X 1.
   [AWM style 2990 80℃ 30V VW-1 **IEEE 1284** compliant]
4) DC Power Adapter **12V/1A** X 1.
5) LA-2124 User's Manual X 1.
6) CD for LA-2124 driver X 1.

## Item Checklist (LA-4000/LA-5000 Series)

1) The LA-4000 (or LA-5000) Aluminum unit.
2) Logic Pod :
   **X5** (LA-4240, LA-5540), **X10** (LA-4280, LA-5580), **X20** (LA-55160)
3) Color wires and E-Z Hook clips :
   **X50** (LA-4240, LA-5540), **X100** (LA-4280, LA-5580), **X200** (LA-55160)
4) D-Sub 25 Pin Cable 125 CM (Male ⇔ Female) X 1.
   [AWM style 2990 80℃ 30V VW-1 **IEEE 1284** compliant]
5) USB 2.0 Adapter with cable X 1.
6) DC Power Adapter :
   **5V/5A** X 1 (LA-4240, LA-4280, LA-5540, LA-5580), **5V/10A** X 1 (LA-55160)
7) LA-4000/5000 User's Manual X 1.
8) CD for LA-4000/5000 driver X 1.
9) Pattern Generator Pod (this is optional to order)

## System Requirements

In order to use the Logic Analyzer card, the following equipment is necessary:

| | |
|---|---|
| Computer System: | Pentium PC system with at least one bi-directional mode (EPP or BPP) or USB interface (USB 1.1 or 2.0 version) |
| Memory: | A minimum of 128 Mega free RAM. |
| Mass Storage: | At least one CD drives and hard disk drives. |
| Display Adapter: | At least one of VGA Adapter. |
| Monitor: | Any monitor compatible with the above display adapter. |
| Operation System: | Windows 95/98/me. |

## Installing Software

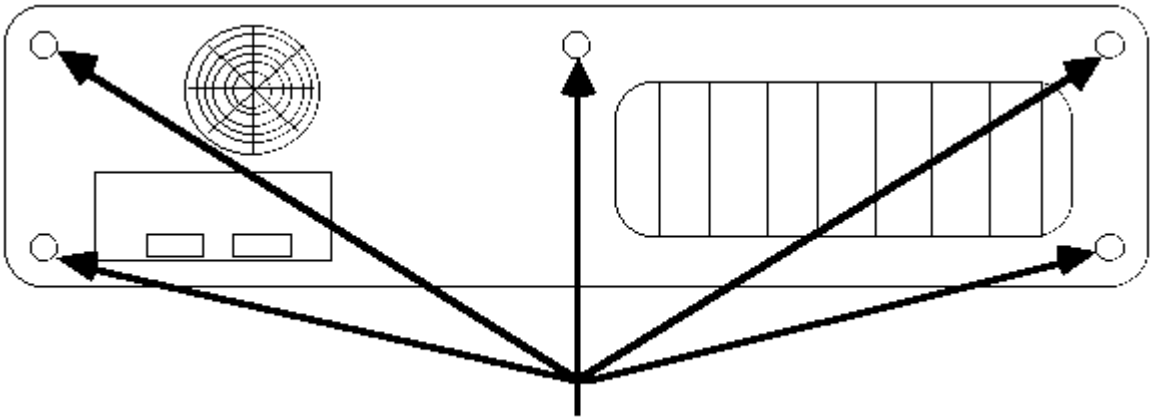
1) Insert the distribution CD into drive E: ("E" is CD driver)
2) Run Windows.
3) Select File menu.
4) Select Run option.
5) Enter file to run E:\la5000\setup.exe (here E: is CD location)
6) Follow the on screen instructions.

## Installing Hardware

### Installing LA-4000 W/ISA communications card

Please follow these instructions for installing the LA-4000 Logic Analyzer Communications Card (LA Com Card). To install the card you will need a screw driver.

01) Turn off the computer and all peripherals connected. Remove the computer power cord from the wall outlet.
02) Disconnect any cables from the rear of the system unit as necessary, making note of their original locations.
03) Use a screw driver to remove the screws on the back of the computer holding the cover on. there are usually five screws, one at each corner and one at the center top of the back panel. Refer to your computer manual for more details on cover removal.



**Remove These Five Screws**

04) Slide the cover of the computer off and put it aside.
05) Locate an empty slot.
06) Remove the slot cover and its screw from the empty slot, retaining the screw to secure the LA Com Card.
07) See the Technical Information: Hardware Address Information section at the end of the manual for how to set the hardware address and make sure that you don't have an address conflict.
08) Carefully insert the LA Com Card into the empty slot, making sure the connector is guided smoothly through the slot opening. Verify that the card edge is securely seated in the slot connector.
09) Secure the LA Com Card with the screw removed with the slot cover.
10) Replace the cover of the computer and secure it with the screws as before.
11) Replace all cables as found before.
12) Connect the Logic Analyzer to the LA Com Card. The connector is keyed so that it will connect one way only.
13) Connect the pods and wires to the Logic Analyzer. See Installing Pods and Connecting wires.

14) Re-connect the power cable to the computer.
15) After checking all connections, turn on the computer and peripherals. You are now ready to install the software.

## Installing LA-4000/LA-5000 Parallel port based Logic Analyzer

Please follow these instructions for installing the LA-4000/LA-5000 Parallel port based Logic Analyzers.

1) Locate an available parallel port.
2) Connect the included DB-25 cable to parallel port.
3) Connect the other end of the DB-25 cable to the LA-4000/LA-5000 series Logic Analyzers. (with a DB-25 mini gender changer)
4) Plug the power supply into the an AC outlet.
5) Plug the power supply into the LA-4000/LA-5000 series Logic Analyzers.
   Note: for LA-4240, LA-4280, LA-5540, LA-5580 use power supply **5V/5A** (Adapter).
   for LA-55160 use power supply **5V/10A** (Adapter).
6) Connect the pods and wires to the Logic Analyzer. See Installing Pods and Connecting wires..
7) Make sure the parallel printer port is set to bi-directional mode. This is done in the Bios configuration program of your computer.
8) After checking all connections, turn on the computer and peripherals. You are now ready to install the software.

## Installing LA-4000/LA-5000 With "USB 2.0 adapter"

Please follow these instructions for installing the LA-4000 /LA-5000 Logic Analyzer with USB 2.0 adapter.

1) Turn off the computer and all peripherals connected. Remove the computer power cord from the wall outlet. Locate an available USB interface (USB 2.0 adapter cover USB 1.1 version).
2) Connect the included USB cable to USB interface.
3) Connect the other end of the USB cable to the USB 2.0 adapter.
4) Plug the Logic Analyzer power supply into the an AC outlet.
5) Plug the Logic Analyzer power supply into the Logic Analyzer.
6) Connect the pods to the Logic Analyzer.
7) After checking all connections, turn on the computer and peripherals. You are now ready to install the software.

## Installing LA-2124 Parallel port based Logic Analyzer

Please follow these instructions for installing the LA-2124 Logic Analyzer Parallel port.

1) Locate an available parallel port.
2) Connect the included DB-25 cable to parallel port.
3) Connect the other end of the DB-25 cable to the LA-2124.
4) Plug the LA-2124 power supply into the an AC outlet.

5) Plug the LA-2124 power supply into the LA-2124.
6) Connect the wires to the Logic Analyzer. See Connecting wires.
7) Make sure the parallel printer port is set to bi-directional mode. This is done in the Bios configuration program of your computer.
8) After checking all connections, turn on the computer and peripherals. You are now ready to install the software.

## Connecting pods to the Logic Analyzer

**LA-4240-32k**
**LA-5540-256k**

These analyzers have 1 row (Labeled "Board 1") of connectors for 5 pods.
The connectors are labeled 1A, 2A, 3A, 4A and 5A. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.

**LA-4280-32k**
**LA-5580-256k**

These analyzers have 2 rows (Labeled "Board 1" and "Board 2") of connectors for 10 pods.
"Board 2" is for channels 40..79
The connectors are labeled 1B, 2B, 3B, 4B and 5B. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.
"Board 1" is for channels 0..39
The connectors are labeled 1A, 2A, 3A, 4A and 5A. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.

**LA-55160-256k**

This analyzer has 4 rows (Labeled "Board 1", "Board 2", "Board 3" and "Board 4") of connectors for 20 pods.
"Board 4" is for channels 120..159
The connectors are labeled 1D, 2D, 3D, 4D and 5D. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.
"Board 3" is for channels 80..119
The connectors are labeled 1C, 2C, 3C, 4C and 5C. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.
"Board 2" is for channels 40..79
The connectors are labeled 1B, 2B, 3B, 4B and 5B. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.
"Board 1" is for channels 0..39

The connectors are labeled 1A, 2A, 3A, 4A and 5A. Connect Pod 1(Ch 0..7), Pod 2(Ch 8..15), Pod 3(Ch 16..23), Pod 4(Ch 24..31), and pod 5(Ch 32..39) to those connectors.

## Connecting wires to Logic Analyzer

**LA-4240-32k**
**LA-5540-256k**
**LA-4280-32k**
**LA-5580-256k**
**LA-55160-256k**

Each pod has 8 channels and 3 ground connections. Each of the grounds is tied together. Push wires onto the posts. Make sure that the wire is actually on the post it is possible to jam the wire between the post and the plastic case and not make a connection.
The BNC on the back on the Logic Analyzer is a trigger out signal. This pin goes low when you hit Go and then goes to logic High when the instrument triggers.

**LA-2124-128K**

The LA-2124-128K has 40 pins. They are organized as follows:
Top row:

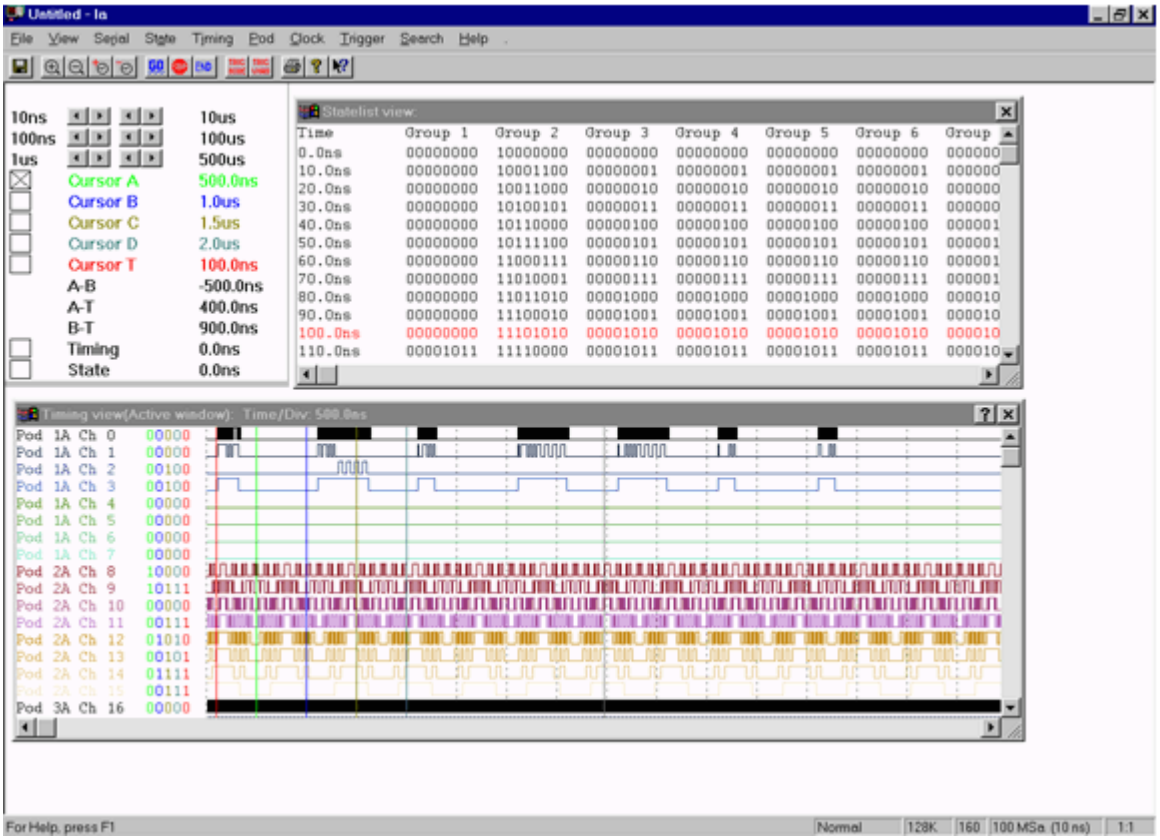
| | |
|---|---|
| 00..1 | Channels 0..15 |
| CLK | External clock input |
| Trig | External trigger out. This pin goes low when you hit Go and then goes to logic High when the instrument triggers |
| GND | Ground connection |

Bottom row:

| | |
|---|---|
| 16..23 | Channels 16..23 |
| NC | Not connected |
| GND | Ground connection |

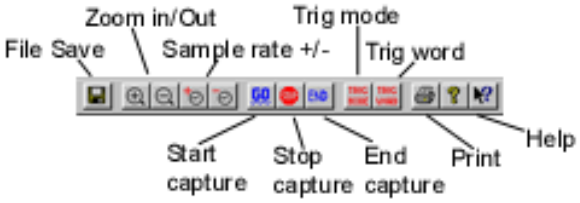
## Getting familiar with the software.

### Main screen



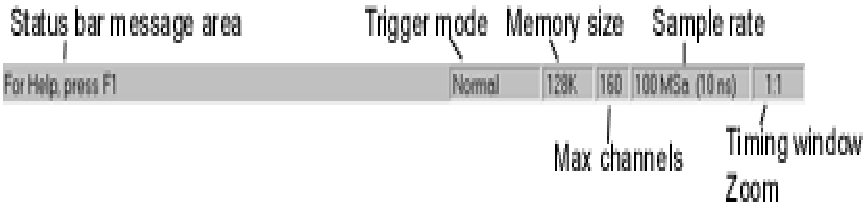

### Menu bar


### Tool bar



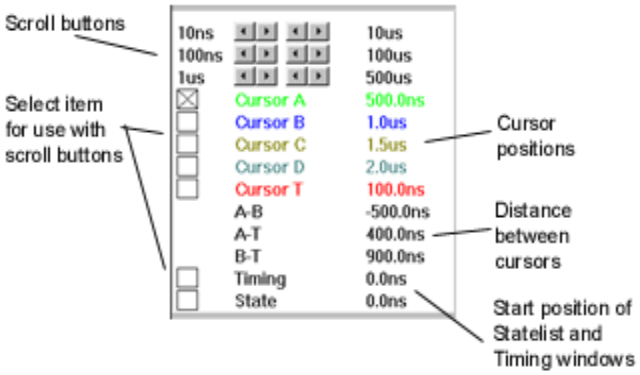
For more info see: Trigger mode, Trigger word, Trigger menu, Memory, Clock menu, zoom and toolbar.

**Status bar**



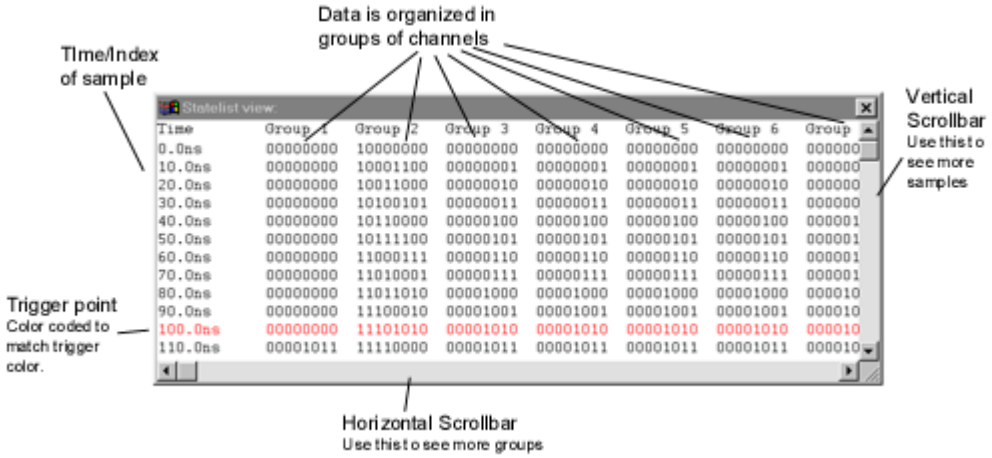

For more info see: Trigger mode, Memory, Clock menu and zoom.

Cursor window



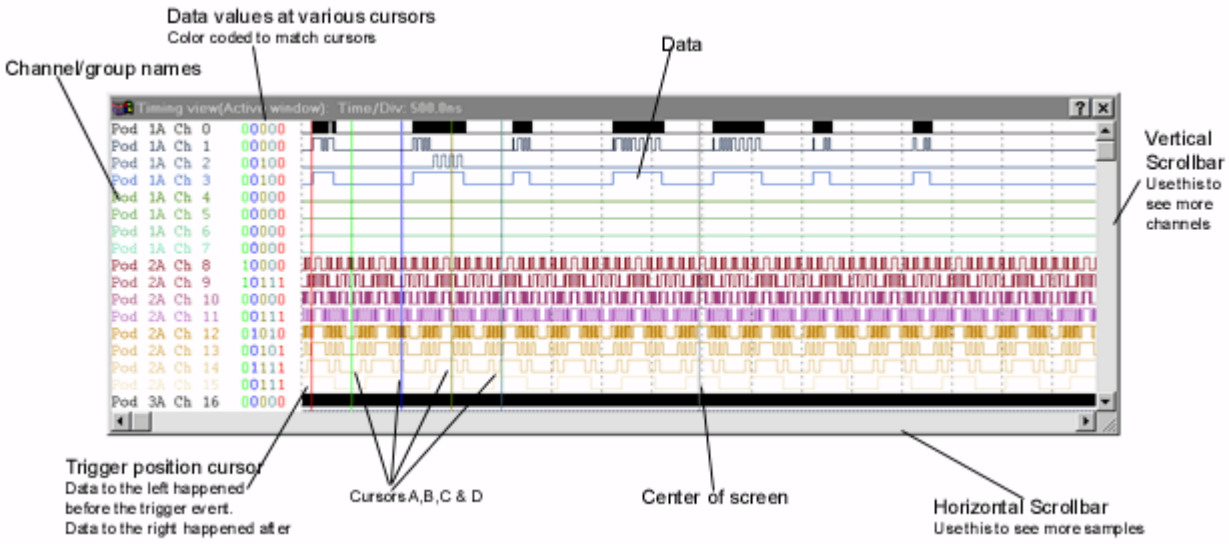

This window displays the positions of the various cursors. It also shows where the timing and statelist windows are scrolled to. Trigger status is displayed at the bottom of the window.

### Statelist window




Data is displayed in statelist format in this window.
For more info see: Statelist, Setting up Statelist window, Setting up channel groups and Statelist vs. Timing windows

### Timing window




For more info see: Timing window, Setting up Timing window, Setting up channel names and colors and Statelist vs. Timing windows

## Trigger mode (trigger menu and toolbar)

Set trigger acquisition mode.

Single The LA looks for the trigger event. When it is found acquire a single

buffer worth of data and stop.

Normal — The LA looks for the trigger event. When it is found acquire a buffer worth of data, re-arm and repeat until stop is hit.

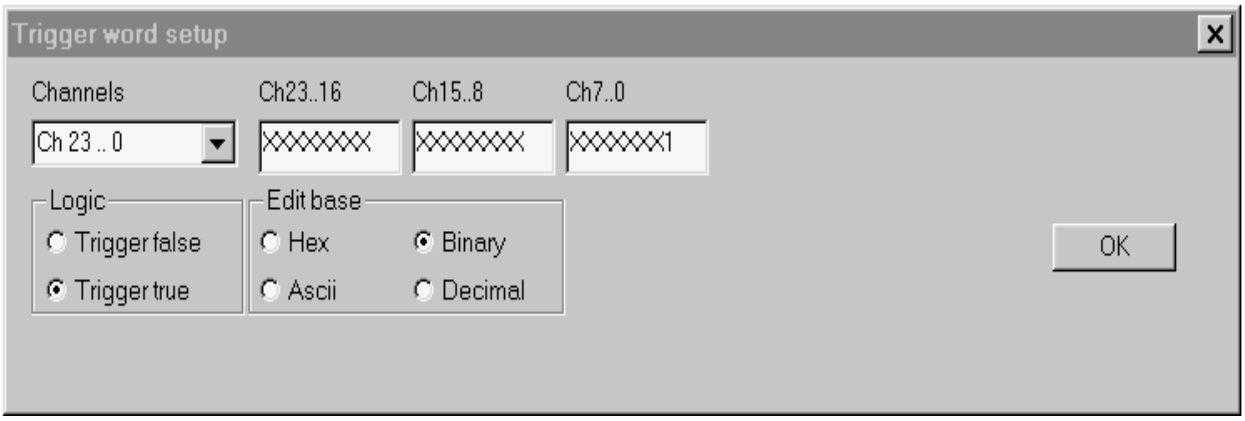
Auto — Similar to Normal except that it will acquire regardless of the trigger event.

## Trigger word setup (trigger menu)

### Setting trigger word (LA-2124)

### *Trigger word setup (LA-2124)*

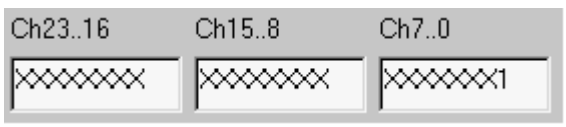
A trigger word is the pattern that the Logic Analyzers needs to see before it will start to acquire data. The trigger word is made of a series of "1", "0" and "x"(don't care) bits.




Ch 23..16
Edit pattern for channels 23 to 16
Ch 15..8Edit pattern for channels 15 to 8
Ch 7..0
Edit pattern for channels 7 to 0
Logic
Trigger if condition is true or false.
Edit base
Select which base you want to edit in.

### *How to set trigger word (LA-2124):*

1) You can edit all 24 channels at a time.

Edit the pattern: 

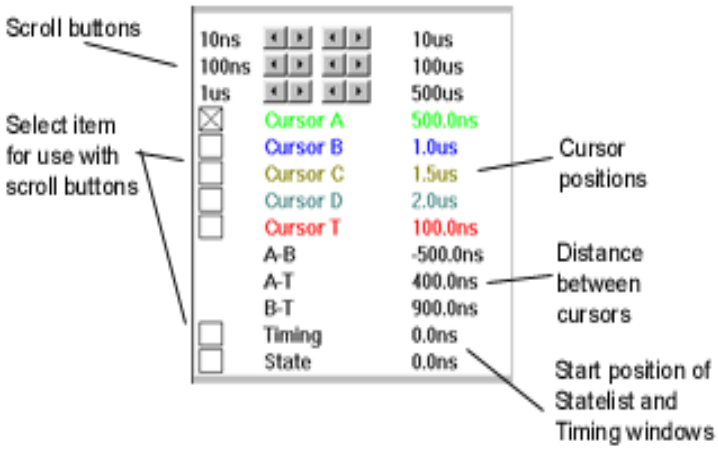
The LSB is to the right. Each bit can be set to "X","1" or "0" (Don't care, true, false).

2) You can set the trigger logic to "True" (trigger when pattern matches) or "False" (trigger when pattern stops matching)

See also: Trigger position

*Trigger position (LA-2124)*

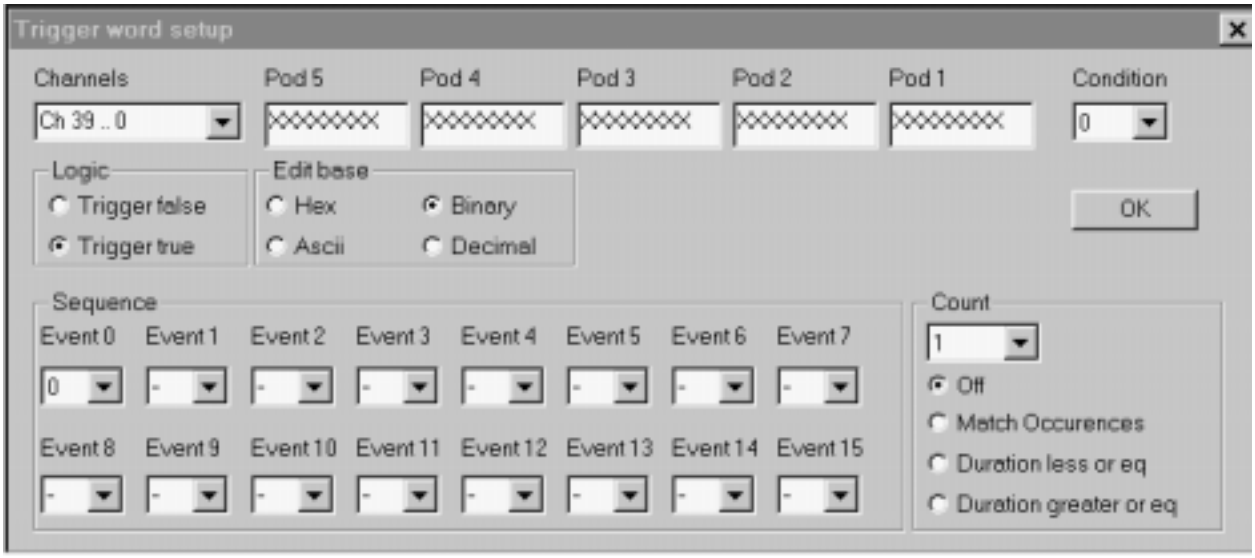
The trigger position defines how much data is captured prior to the trigger event and how much data stored after it. You set the Trigger position by moving the trigger cursor. This feature allows you to see the data that led up to the trigger as well as what happened after the trigger.




Setting trigger word (LA-4000/LA-5000)

*Trigger word setup (LA-4000/LA-5000)*

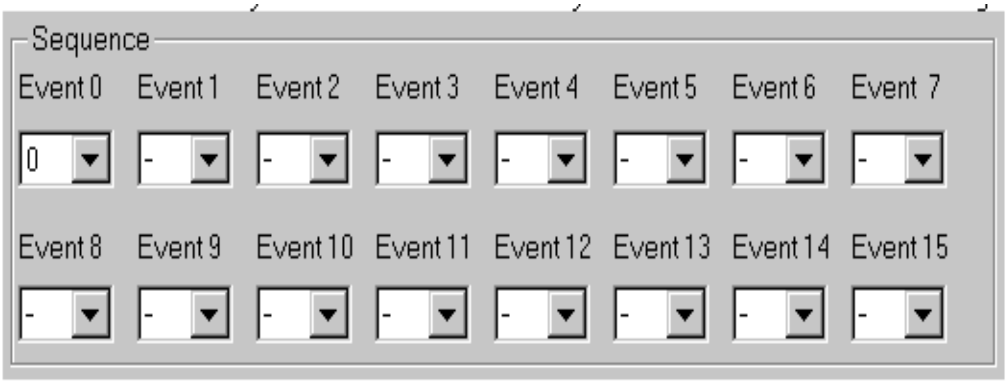
A sequence of up to 16 trigger words can be set. A trigger word is the pattern that the Logic Analyzers needs to see before it will start to acquire data. The trigger word is made of a series of "1", "0" and "x" (don't care) bits.




| | |
|---|---|
| Channels | Select which channel range to edit. |
| Pod 5..1 | Edit pattern for each pod |
| Condition | Select which word you want to edit. |
| Logic | Trigger if condition is true or false. |
| Edit base | Select which base you want to edit in. |
| Sequence | Select which word you want to use for each of the 16 levels. |
| Count | The number of times you want to see the last word in the sequence before you trigger. |

*How to set trigger word (LA-4000/LA-5000):*

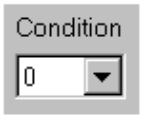
1) The trigger words are edited here:
You can edit 40 channels at a time. If your unit has more channels you will need to use the channel range indicator to select the edit range:



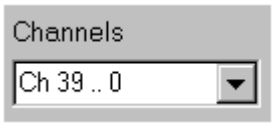
Edit the pattern: 


The LSB is to the right. Each bit can be set to "X","1" or "0" (Don't care, true, false)

2) You can build a library of 16 trigger words (called conditions).

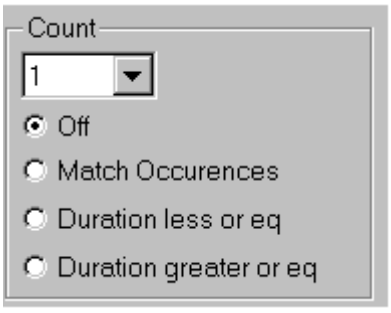
You select which one you want to edit with this control. 


3) The LA-4000 / LA-5000 series Logic Analyzers have 16 level sequential triggering.
That means that can specify up to 16 conditions and the Logic Analyzer won't trigger until all of the conditions have been met in the order specified.
Note: You don't need to use all 16 of the levels and patterns can be repeated.




Use the list boxes to select which condition from the library of trigger patterns you want in each trigger level. Any level set to "-" will be skipped

Note: A pattern can be repeated in the sequence.

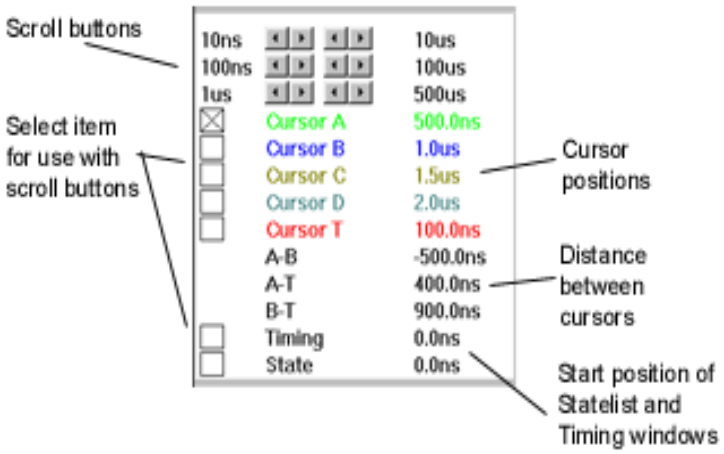



The last word in the sequence has some extra features:
You can look for that pattern "Count" number of times.
4) You can set the trigger logic to "True" (trigger when pattern matches) or "False" (trigger when pattern stops matching).

See also: Trigger position

*Trigger position (LA-4000/LA-5000)*

The trigger position defines how much data is captured prior to the trigger event and how much data is stored after it. You set the Trigger position by moving the trigger cursor. this feature allows you to see the data that led up to the trigger as well as what happened after the trigger.

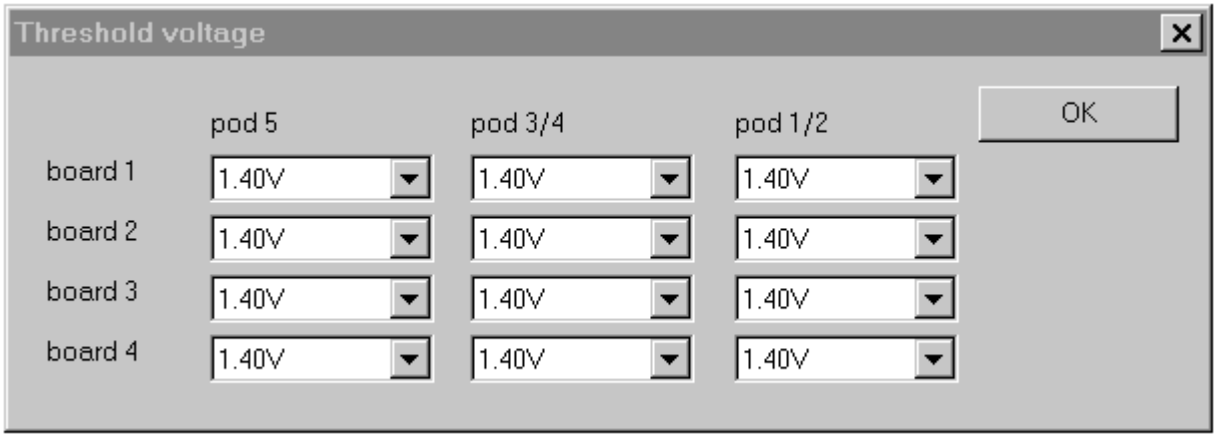



*Trigger menu*

| | |
|---|---|
| Go | Start looking for trigger event. |
| Stop | Stop looking for trigger event. |
| End | End capture and display data captured up to this point independent of trigger status. |
| Trigger word | Define trigger event. |
| Threshold level | Set threshold level. |
| Mode | Set trigger mode. |

See also: Trigger Mode and Trigger position .

## Threshold voltage setup




Set the threshold voltage for one or more pods. Multiple threshold voltages can be set.
Each pod represents 8 channels.

## Clock menu

Select an internal clock rate or an external clock for sampling.

Clock menu for LA-2124

Clock menu for LA-2124

This menu allows you to select memory size and sample rate (Internal clock or external clock).

LA-2124-128K

| | |
|---|---|
| 1K | Set buffer length to 1K sample points |
| 128K | Set buffer length to 128K sample points |

---

| | |
|---|---|
| External Rising | Sample on rising edge of the external clock input. |
| External Falling | Sample on falling edge of the external clock input. |
| 100 MHz (10 ns) | Sample on Internal clock. |
| 50 MHz (20 ns) | Sample on Internal clock. |
| 20 MHz (50 ns) | Sample on Internal clock. |
| 10 MHz (100 ns) | Sample on Internal clock. |
| 5 MHz (200 ns) | Sample on Internal clock. |
| 2 MHz (500 ns) | Sample on Internal clock. |
| 1 MHz (1 us) | Sample on Internal clock. |
| 500 KHz (2 us) | Sample on Internal clock. |
| 200 KHz (5 us) | Sample on Internal clock. |
| 100 KHz (10 us) | Sample on Internal clock. |

| | |
|---|---|
| 50 KHz (20 us) | Sample on Internal clock. |
| 20 KHz (50 us) | Sample on Internal clock. |
| 10 KHz (100 us) | Sample on Internal clock. |
| 5 KHz (200 us) | Sample on Internal clock. |

**Note: The software only transfers data to the PC when the buffer is full. If you are using a slow clock it might take a long time to fill the buffer.**

**Recording time/Acquisition time/Capture time/Buffer Length**

The Logic analyzer will acquire data for time equal to Buffer length * clock rate.
Example:

If buffer length = 128K and sample rate = 100KHz. The LA will record for 1.32 seconds (128K * 10 us).

Clock menu for LA-4240-32K and LA-4280-32K

Clock menu for LA-4240-32K and LA-4280-32K

This menu allows you to select memory size and sample rate (Internal clock or external clock).

**LA-4240-32K**
**LA-4280-32K**

| | | **Active Pods** |
|---|---|---|
| 8K | Set memory to 8K mode | |
| 32K | Set memory to 32K mode | |
| --- | --- | |
| External[0] Rising | Use external clock bit 0(Pod 5A, bit 0) rising edge. | All Pods active. |
| External[0] Falling | Use external clock bit 0(Pod 5A, bit 0) falling edge. | All Pods active. |
| External .... | | All Pods active. |
| 200 MHz (5 ns) | Pods 1* & 2* are at 200MHz, Pod 5* is at 100MHz, Pods 3* & 5* are off | |
| 100 MHz (10 ns) | | All Pods active. |
| 50 MHz (20 ns) | | All Pods active. |
| 20 MHz (50 ns) | | All Pods active. |
| 10 MHz (100 ns) | | All Pods active. |
| 5 MHz (200 ns) | | All Pods active. |
| 2 MHz (500 ns) | | All Pods active. |
| 1 MHz (1 us) | | All Pods active. |
| 500 KHz (2 us) | | All Pods active. |
| 200 KHz (5 us) | | All Pods active. |
| 100 KHz (10 us) | | All Pods active. |
| 50 KHz (20 us) | | All Pods active. |
| 20 KHz (50 us) | | All Pods active. |
| 10 KHz (100 us) | | All Pods active. |
| 5 KHz (200 us) | | All Pods active. |
| 2 KHz (500 us) | | All Pods active. |

| | |
|---|---|
| 1 KHz (1 ms) | All Pods active. |
| 500 Hz (2 ms) | All Pods active. |
| 200 Hz (5 ms) | All Pods active. |
| 100 Hz (10 ms) | All Pods active. |
| 50 Hz (20 ms) | All Pods active. |
| 20 Hz (50 ms) | All Pods active. |
| 10 Hz (100 ms) | All Pods active. |
| 5 Hz (200 ms) | All Pods active. |
| 2 Hz (500 ms) | All Pods active. |
| 1 Hz (1 s) | All Pods active. |

Pattern Generator functions are not available at 200MHz mode.

**Note: The software only transfers data to the PC when the buffer is full. If you are using a slow clock it might take a long time to fill the buffer.**

**Recording time/Acquisition time/Capture time/Buffer Length**

The Logic analyzer will acquire data for time equal to Buffer length * clock rate.
Example:

If buffer length = 8K and sample rate = 1KHz. The LA will record for 8.096 seconds (8K * 1ms).

Clock menu for LA-5540-256K, LA-5580-256K and LA-55160-256K

Clock menu for LA-5540-256K, LA-5580-256K and LA-55160-256K

This menu allows you to select memory size and sample rate (Internal clock or external clock).

| | | **Active Pods** |
|---|---|---|
| 8K | Set memory to 8K mode | |
| 128K | Set memory to 128K mode | |
| ---------- | | |
| External[0] Rising | Use external clock bit 0(Pod 5A, bit 0) Rising edge. | All Pods active. |
| External[0] Falling | Use external clock bit 0(Pod 5A, bit 0) Falling edge. | All Pods active. |
| External…. | | All Pods active. |
| 500 MHz (2 ns) | Pods 1*,3*,5* are at 500MHz, Pods 2*, 4* are off | |
| 250 MHz (4 ns) | | All Pods active. |
| 100 MHz (10 ns) | | All Pods active. |
| 50 MHz (20 ns) | | All Pods active. |
| 20 MHz (50 ns) | | All Pods active. |
| 10 MHz (100 us) | | All Pods active. |
| 5 MHz (200 us) | | All Pods active. |
| 2 MHz (500 us) | | All Pods active. |
| 1 MHz (1 us) | | All Pods active. |
| 500 KHz (2 us) | | All Pods active. |
| 200 KHz (5 us) | | All Pods active. |

| | |
|---|---|
| 100 KHz (10 us) | All Pods active. |
| 50 KHz (20 us) | All Pods active. |
| 20 KHz (50 us) | All Pods active. |
| 10 KHz (100 us) | All Pods active. |
| 5 KHz (200 us) | All Pods active. |
| 2 KHz (500 us) | All Pods active. |
| 1 KHz (1 ms) | All Pods active. |
| 500 Hz (2 ms) | All Pods active. |
| 200 Hz (5 ms) | All Pods active. |
| 100 Hz (10 ms) | All Pods active. |
| 50 Hz (20 ms) | All Pods active. |
| 20 Hz (50 ms) | All Pods active. |
| 10 Hz (100 ms) | All Pods active. |
| 5 Hz (200 ms) | All Pods active. |
| 2 Hz (500 ms) | All Pods active. |
| 1 Hz (1 s) | All Pods active. |

Pattern Generator functions are not available at 250MHz and 500MHz modes.

**Note: The software only transfers data to the PC when the buffer is full. If you are using a slow clock it might take a long time to fill the buffer.**

**Recording time/Acquisition time/Capture time/Buffer Length**

The Logic analyzer will acquire data for time equal to Buffer length * clock rate.

Example:

If buffer length = 8K and sample rate = 1KHz. The LA will record for 8.096 seconds (8K * 1ms).

### External clock (LA-2124)

External clock setup. The LA has up to 1 external clock input. This input can be set to rising or falling. The LA will acquire 1 sample everytime it sees a clock.

Note 1: The LA only transfers data to the PC after the data buffer is full. Slow external clocks might take a very long time to fill the buffer.

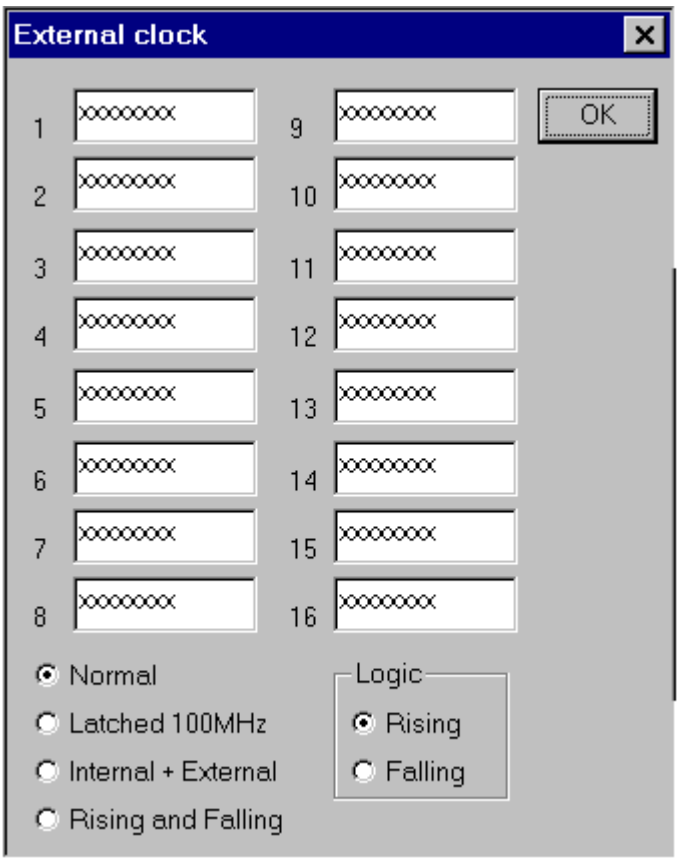
Note 2: Make sure that your external clock has enough pulses to fill the buffer or the instrument will never transfer data.

### External clock (LA-4000/LA-5000)

External clock setup. The LA has up to 8 external clock inputs. These inputs can be combined to create very complex clocking. Pod 5A is used for the external clock.

Note:

The LA only transfers data to the PC after it has received a full buffer worth of data. If your clock is very slow it might take a long time to fill the buffer. Please make sure your clock happens enough times to fill the buffer.




| | |
|---|---|
| 1..16 | 16 sets of 8 bit patterns that are OR's together to form a complex clock. Each bit can be set to 0, 1 or X. |
| Logic | Clock on the rising or falling edge. |

**Modes:**

| | |
|---|---|
| Normal | External clock |
| Latched 100MHz | Clock on external + 100MHz internal (see Internal + external). |
| Internal+external | Mix of internal + external clock. This AND's the Internal clock with the external clock. Example: If external Pattern 1 = xxxxxxx0 and all other patterns are xxxxxxxx and the internal clock is set to 100MSa(10ns). The LA will sample when bit 0 is low and the internal clock is high. In this example the LA will sample approximately 10 times if bit 0 stays low for 100ns. |
| Rising and falling | Clock on the rising and the falling edge of the external clock. |

**Logic:**

| | |
|---|---|
| Logic rising | Clock on the external rising edge. |
| Logic falling | Clock on the external falling edge |

**How to use:**

1) Each word represents the 8 external clocks  Each bit can be set

0(low), 1(high) or X(don't care).
2) The 16 words are OR's together to form a complex clock.
3) Set clock mode:
Normal Sample on the external clock.
Internal + external Mix of internal + external clock.
Rising and falling Clock on the rising or the falling edge of the external clock.
4) Set Logic to rising or falling.

**Examples:**

Example 1: Pattern 1 = xxx1xxx0 and all other patterns are xxxxxxxx
Result: Sample when line 4 is HIGH and line 0 is LOW.

Example 2: Pattern 1 = xxx1xxx0, Pattern 2 = xxxx xx11 and all other patterns are xxxxxxxx
Result: Sample when line 4 is HIGH and line 0 is LOW or when Lines 1 and 0 are HIGH.

See also: GO, STOP and END keys.

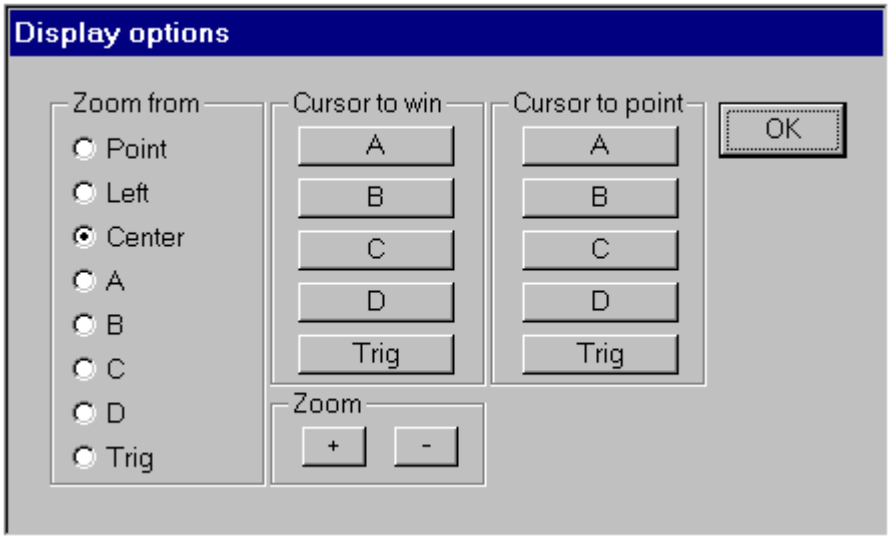
## Zoom (timing)

Select a zoom ratio for the timing window. You can display the timing data in a compressed or expanded format. Zooming in lets you see great detail. Zooming out lets you see large abundant of data.

Zoom can be changed in the following ways:
1. Timing/zoom menu
2. Zoom toolbar buttons 
3. Control click(Timing window) Zooms in on point clicked.
Shift click(Timing window) Zooms out on point clicked.
4. Right clicking on the data area of the timing window brings up a zoom dialog box.

See also: timing menu, Toolbar and the Zoom dialog box.

## Zoom dialog box




This window appears when you right click in the waveform area of the timing window.

In this window you can do the following:

**Zoom:**

Zoom in or out with the + or - buttons.
Select a zoom reference point (only active in this window).

| | |
|---|---|
| Point: | Only active if you right clicked on the timing window to bring up this window. The zoom point is the point you right clicked. |
| Left: | Zoom around the left edge. |
| Center: | Zoom around the center of the screen. |
| A | Zoom around cursor A. |
| B | Zoom around cursor B. |
| C | Zoom around cursor C. |
| D | Zoom around cursor D. |
| Trigger: | Zoom around trigger cursor. |

**Move cursor to window**:
To move a cursor to the timing display window click its button.

**Cursor to point**:
Move a cursor to the point you right clicked on: (only available by right clicking the timing window) Select the cursor by clicking on its button.

## Timing window

This window shows the data in a timing waveform style display. The channel names will be on the left edge with the data going horizontally. To the right of the channel

names are the values of data at each cursor (it is color coded to match the cursors).
The vertical scrollbar moves the window up and down to display more channels.
The horizontal scrollbar moves the data forward and backward in time. The starting point of the display is shown in the cursor window.

You can use this with either the internal or external clocks.

The channel order and display characteristics can be changed with the timing setup window.

Activate this window in the timing menu.

The size of the window can be changed by grabbing an edge of the window and dragging it.

When the Timing window is selected (title says "active window")

Left and right arrows scroll data with respect to time.
Up and down arrows scroll data with respect to channels.
Holding shift key down while using arrows will scroll by a factor of 10.
Holding control key down while using arrows will scroll by a factor of 100.
Holding shift and control keys down while using arrows will scroll by a factor of 1000.

| | |
|---|---|
| Control A: | Brings window to cursor. |
| Control B: | Brings window to cursor. |
| Control C: | Brings window to cursor. |
| Control D: | Brings window to cursor. |
| Control T: | Brings window to cursor. |

| | |
|---|---|
| Shift A: | Brings cursor to window. |
| Shift B: | Brings cursor to window. |
| Shift C: | Brings cursor to window. |
| Shift D: | Brings cursor to window. |
| Shift T: | Brings cursor to window. |

Note:
- This only works on the selected window.
- Click on the window to select it.
- The selected window will say "active window" in the title bar.

When either window is selected

Right click on timing window

Brings up zoom dialog box.
Allows you to zoom on center or left edge of screen.
Other zoom features.

Timing window

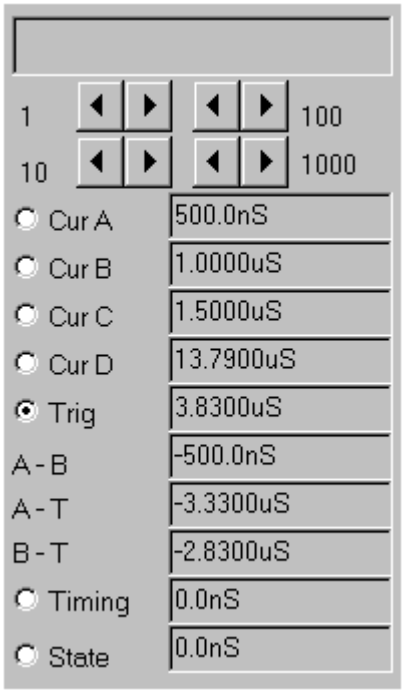
Right clicking on check boxes will set the item to zero.

'Z' zooms in on data

Shift Z zooms out on the data

See also: How to:Setting up the Timing window.

## Cursor window




Item selection

Click on the item you want to move.

Movemen

Select an item by clicking on its box.

Use the arrow buttons  to move the selected item. Their are 6 sets of arrow buttons. The set labeled '1' moves the item by 1 sample, the set labeled 10 moves it by 10 samples, etc...

Right clicking on one of the check boxes sets that item to 0.

Measurements

The position of each cursor, the differences between some of them and the position of the Timing and State windows are displayed.

The value is either in Time or Sample units. To select between time and sample number display go to the view/samples or time menu.

Trigger/capture status

Trigger/capture status is also displayed.

See also: How to: using cursors.

## View menu commands

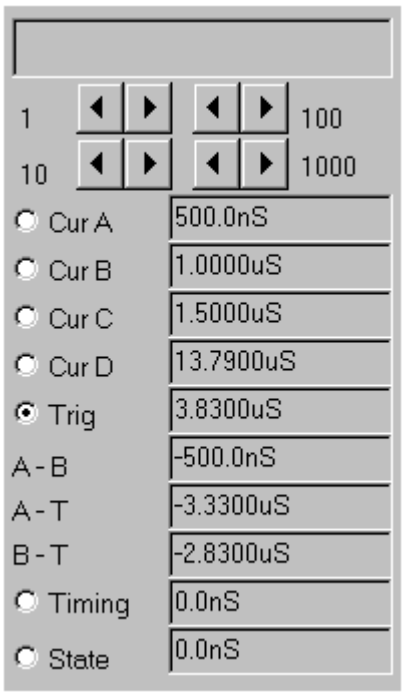
The View menu offers the following commands:

| | |
|---|---|
| Toolbar | Shows or hides the toolbar. |
| Status Bar | Shows or hides the status bar. |
| Colors | Set various display colors. |
| Edit channel names or colors | Set channel names and colors. |
| Samples or Time | Set display mode of time. Display in units of time or samples. |

## Using cursors

Cursors are used to mark points of interest in the data, to measure time between events and to define pre/post trigger position.

**Cursor window**




Moving a cursor:

1. In the cursor window you can select a cursor by clicking on the checkbox to the left of the cursors name and then using the arrow buttons in the cursor window to move it. The six sets of arrow buttons will move the selected cursor by the amount listed next to the arrows.
2. You can also "grab" the cursor by left clicking on it in the Timing or Statelist window and then move it by "dragging" it to a new location.
3. The Timing and Statelist menus have selections that allow you to bring the cursors onto their views.
4. You can also right click on the timing window and bring up the zoom dialog box. This dialog box will let you move cursors to the point that you right clicked or to the current view.

Viewing cursor position and time between cursors:

1. The cursor position is graphically depicted in the Timing or Statelist windows.
2. Cursor position is also displayed numerically in the cursor window . To change between Time and Sample number go to the view/Samples or time menu.

Pre-trigger
Trig. Cursor is the Trigger cursor. Its value defines the pre/post trigger position (how much of the buffer represents events that happen before and after the trigger condition is met).

For example: If the buffer was 128ms long and the trigger cursor was set to 40ms and you captured data. The first 40ms of this data would represent the 40ms prior to the trigger condition being met and the last 88ms would be what happened after the trigger event.

## Statelist window

This window shows the data in a statelist style display. The data will be displayed in columns. each column represents a group of channels and can be displayed in different bases. above each column will be its name. The horizontal scrollbar moves the window left and right to display more channels. The vertical scrollbar moves the data forward and backward in time. the starting point of the display is shown in the cursor window.

You can change the groups, column order and bases in the Statelist setup and group define menus.

You can use this with either the internal or external clocks.

Activate this window in the statelist menu.

The size of the window can be changed by grabbing an edge of the window and dragging it.

If the State window is selected (title bar says "active window")

Up and down arrows scroll data with respect to time.
Left and right arrows scroll data with respect to channels.
Holding shift key down while using arrows will scroll by a factor of 10.
Holding control key down while using arrows will scroll by a factor of 100.
Holding shift and control keys down while using arrows will scroll by a factor of 1000.

| | |
|---|---|
| Control A: | Brings window to cursor. |
| Control B: | Brings window to cursor. |
| Control C: | Brings window to cursor. |
| Control D: | Brings window to cursor. |
| Control T: | Brings window to cursor. |

| | |
|---|---|
| Shift A: | Brings cursor to window. |
| Shift B: | Brings cursor to window. |
| Shift C: | Brings cursor to window. |
| Shift D: | Brings cursor to window. |
| Shift T: | Brings cursor to window. |

Note:

This only works on the selected window.
Click on the window to select it.
The selected window will say "active window" in the title bar.

See also: How to: setting up Statelist window.

## Statelist setup

The statelist window is organized by columns. Each column is a channel group. Each group has one or more channels in it. This window lets you do the following:

Select which column displays which group.
Choose a base (Hex, Ascii, Decimal or Translation table) for the column.

Note:

You can display a group in more than one column and in different bases.

By default the groups are organized by pod. You can edit and create groups with Group define.

Activate this window via the state menu or by left clicking the group names in the statelist display.

## Translation tables

Translation tables work with the statelist display. They allow you to do simple disassembly type functions. You can enter the following in to the table:

| | |
|---|---|
| Bit pattern | 32 bits wide of 1, 0, or X (don't care) |
| String | The string that will replace the bit pattern. |
| Number of samples to skip. | Number of clock cycles to skip before starting to look for more patterns. |

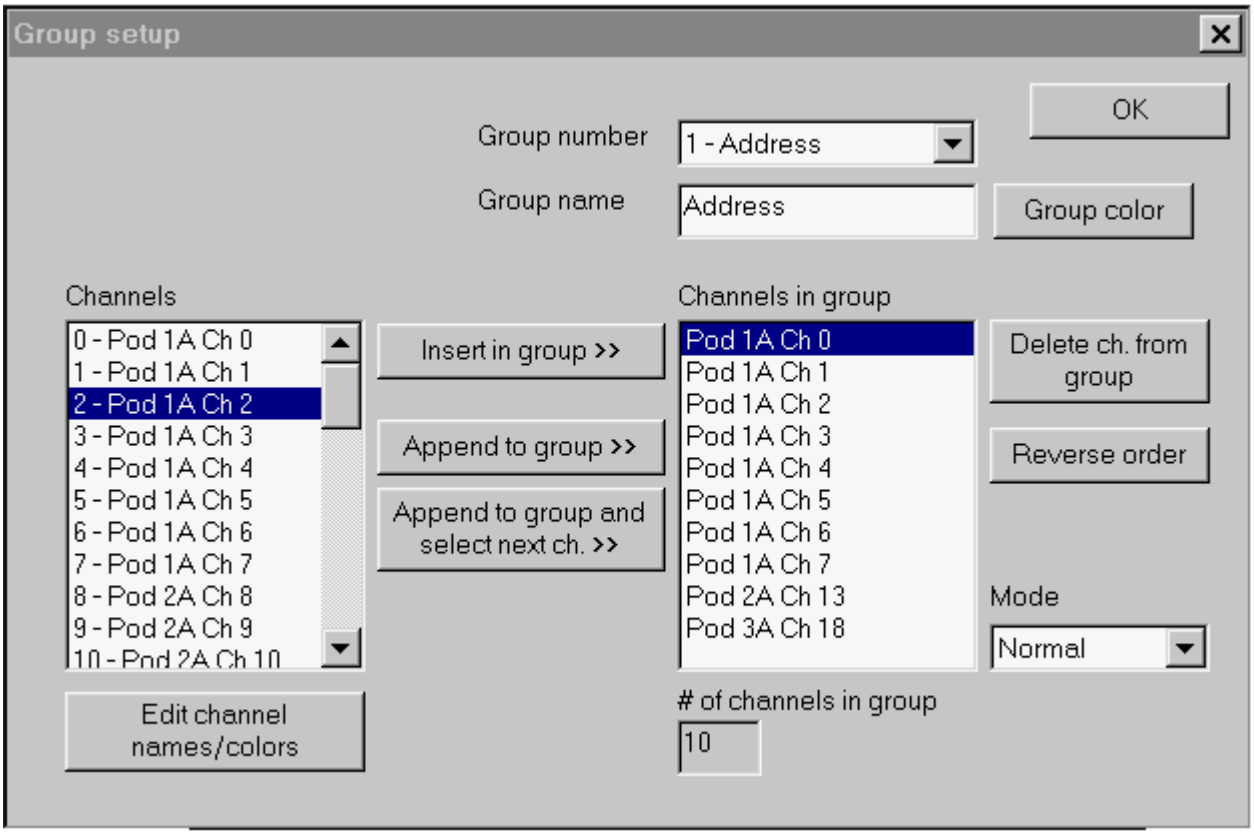
Example:

If MOV AX,BX had an opcode of 0x9 and it took 3 clock cycles to execute.

Set the following:

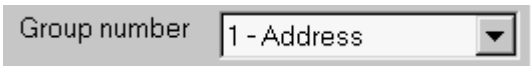
| | |
|---|---|
| Bit pattern to | 01001 |
| String to | MOV AX,BX |
| Skip to | 2 |

## Group define



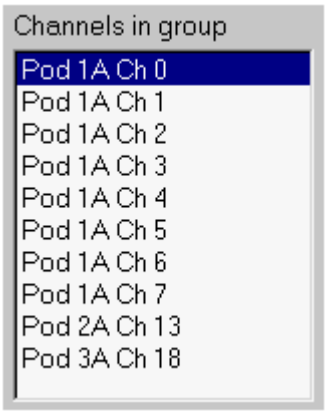

The channels can be organized into groups for display in the Statelist or Timing windows. Thedefault organization is by pods. In this window you can do the following:
Defining groups:

1. Select group.

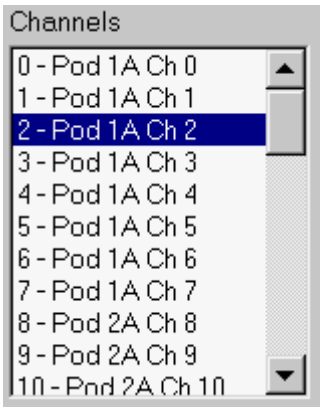



2. Edit name (14 character maximum).


3.The channels currently in the group are listed in the "Channels in group" window:




4. All of the channels in the Logic Analyzer are in the "channels" window:



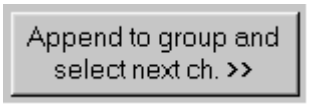

5. Use the following buttons to edit the list of channels in the selected group:

Clicking this button would cause the selected channel (Pod 1A Ch 2)

from the "channel" window to be inserted in the "channels in group" window. The channel would be insert into the position before the selected channel (Pod 1A Ch 0).

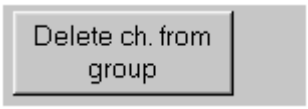
Clicking this button would cause the selected channel (Pod 1A Ch 2)

from the "channel" window to be appended to the end of the list of channels in the "channels in group" window.



Clicking this button would cause the selected channel (Pod 1A Ch 2)

from the "channel" window to be appended to the end of the list of channels in the "channels in group" window.
Then next channel in the "channel" window will be selected.



Clicking this button deletes the selected channel from the

"channels in group" window.

Clicking this button reverses the order of the channels in the

"channels in group" window.
6. Select mode with the mode box

7. You can edit a channels name or color by clicking on the 

button.

Activate this window via the state menu ,serial menu or from statelist setup.

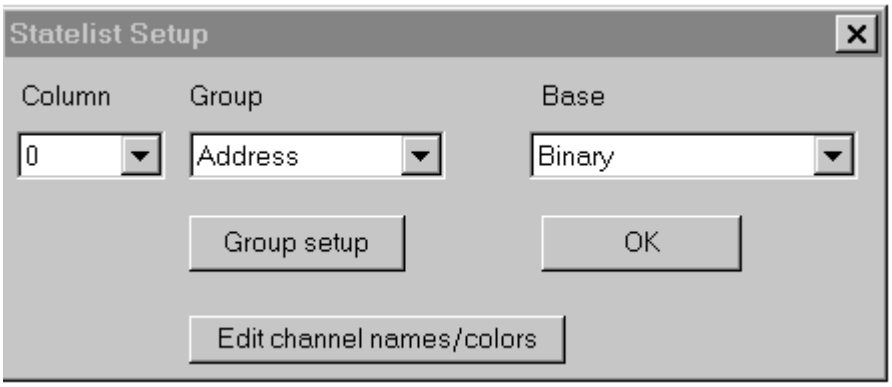
Statelist menu

| | |
|---|---|
| Statelist window | If checked the statelist window will be displayed. |
| Statelist setup | Setup statelist display parameters. |
| Group Define | Define channel grouping. |
| Edit Translation table | Edit Translation table |

| | |
|---|---|
| Cursor A to Statelist | Move cursor to Statelist window. |
| Cursor B to Statelist | Move cursor to Statelist window. |
| Cursor C to Statelist | Move cursor to Statelist window. |
| Cursor D to Statelist | Move cursor to Statelist window. |
| Trig cursor to Statelist | Move cursor to Statelist window. |
| Move all cursors to Statelist | Move all cursors to Statelist. |
| Align Statelist with Timing win | Align the start of the Statelist window with the Timing window. |

| | |
|---|---|
| Statelist to cursor A | Move start of Statelist window to cursor. |
| Statelist to cursor B | Move start of Statelist window to cursor. |
| Statelist to cursor T | Move start of Statelist window to cursor. |

## Setting up the Statelist window




The statelist window is organized in columns. Each column represents a group of channels. Each column can be displayed in a different base (HEX, Ascii, Decimal or Translation table).

Setting up the statelist display.

1. Set column.
2. Select which group to display in that column. Groups can repeat in multiple
3. columns and can be in different bases.
4. Set Base.

Note:

Use Group setup to define/edit the actual channel groups

See also: Statelist window , Edit channel names, Group define (how to) and group define.

## Timing Setup

Normal setup

### How to: Setting up the Timing window

The timing window is organized as a series of lines. Each line represents a single channel or a group of channels. Each line can be drawn in a different size/base.

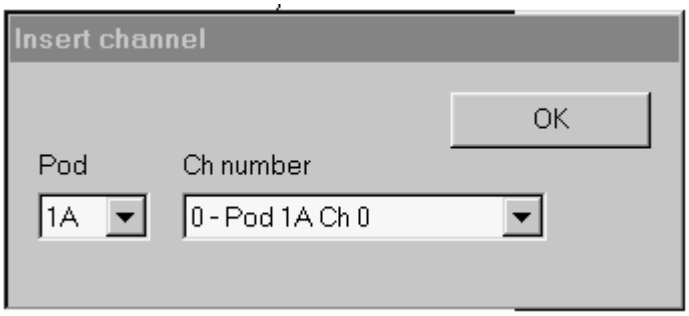
Adding a channel to the timing window:

1. Right click on the channel name area of the timing window. The channel will be

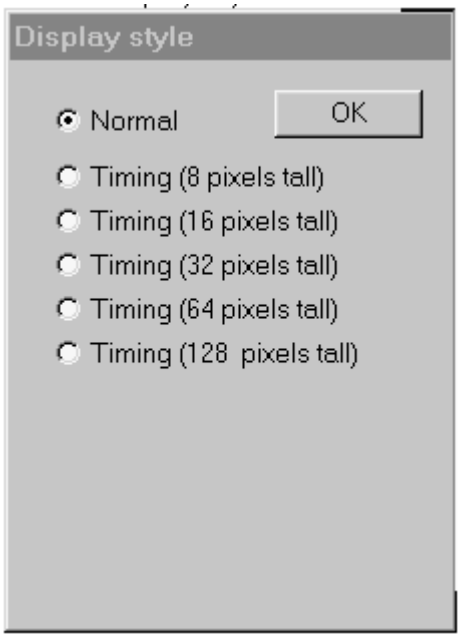
inserted on the line that you click on.

2. Click on the "Insert channel" button.


3. Select the channel you want to insert and click on "OK".



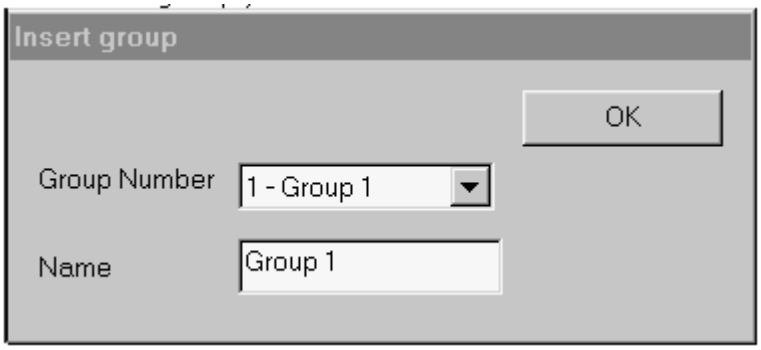

4. Select display style and click on "OK".



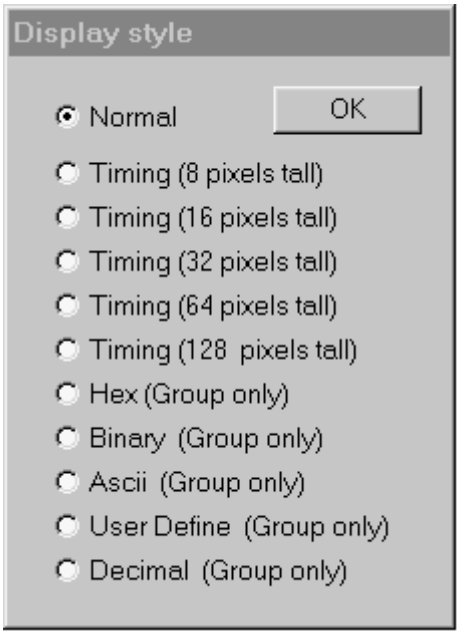

## Adding a group to the timing window:

1. Right click on the channel name area of the timing window. The group will be inserted on the line that you click on.
2. Click on the "Insert group" button.


3. Select the group you want to insert and click on "OK".




4. Select display style and click on "OK".



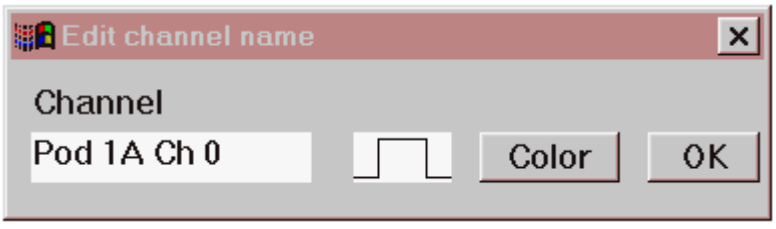

## Deleting a channel or group from the timing window:

1. Right click on the channel name area of the timing window. The line that will be deleted is he line that you click on.
2. Click on the "Delete line" button.


## Editing a channel name or color:

1. Right click on the channel name area of the timing window. The channel that will be changed is the line that you click on.
2. Click on the "Edit channel" button.


3. Click on "Edit channel".



You can edit the channel name or click on the "Color" button to edit the color.

*Editing a group*

1. Right click on the channel name area of the timing window. The group that will be changed is the group that you click on.
2. Click on the "Edit group" button.

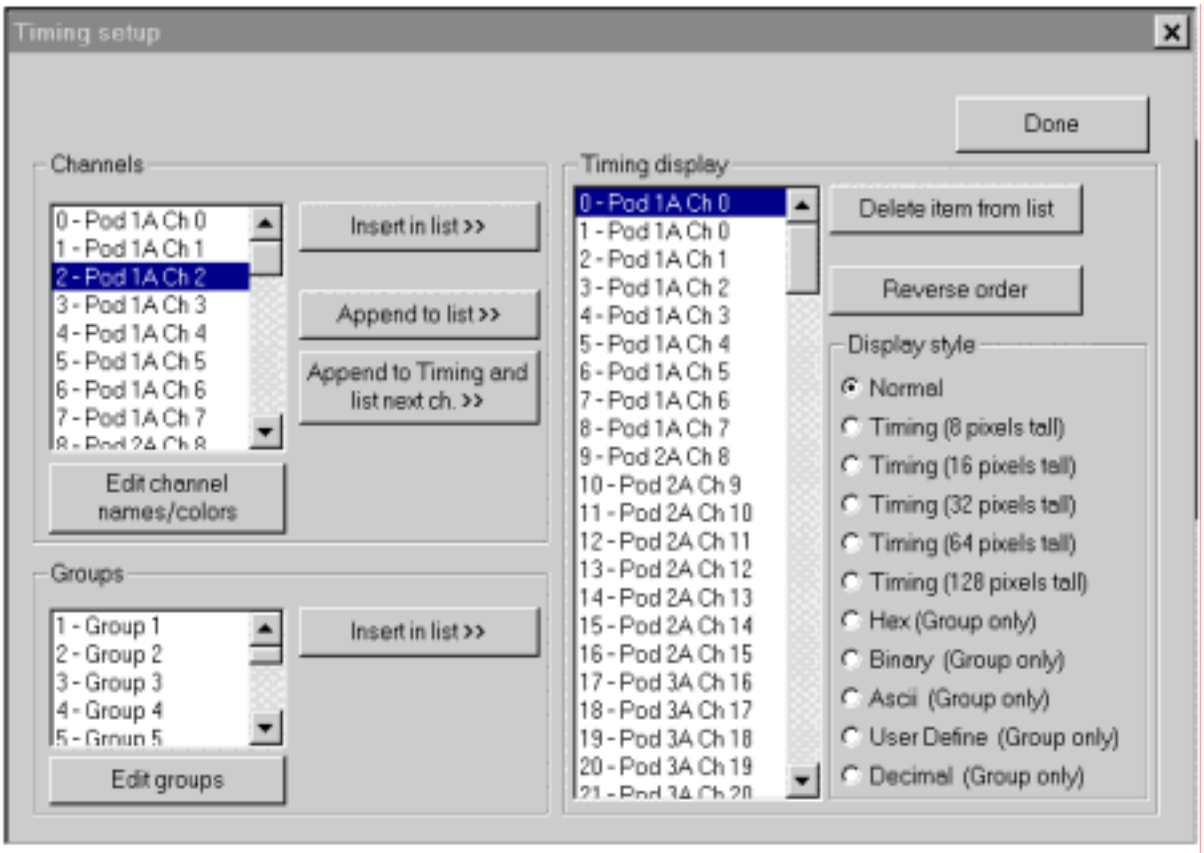

3. See "How to: Group define"

See also: Timing window.

Advanced setup

## Timing Setup (Advanced)

The Timing window is organized in rows. Each row can display a channel or a channel group. If you are displaying a channel you can select from a list of various timing height display options. If a group is being displayed you can select from a list of different bases as well a various height timing displays.
In the "Timing display" section you will see a list of the channels in the display order. You can change the order, delete and insert new display lines.




Single channel - display options:

| | |
|---|---|
| Normal | Display timing waveform. |
| Timing(8) | Display timing waveform 8 pixels tall. |
| Timing(16) | Display timing waveform 16 pixels tall. |
| Timing(32) | Display timing waveform 32 pixels tall. |
| Timing(64) | Display timing waveform 64 pixels tall. |
| Timing(128) | Display timing waveform 128 pixels tall. |

Group - display options:

| | |
|---|---|
| Timing(8) | Display group as timing waveform 8 pixels tall. This will look like an "Analog" waveform. |
| Timing(16) | Display group as timing waveform 16 pixels tall. This will look like a "Analog" waveform. |
| Timing(32) | Display group as timing waveform 32 pixels tall. This will look like an "Analog" waveform. |
| Timing(64) | Display group as timing waveform 64 pixels tall. This will look like an "Analog" waveform. |
| Timing(128) | Display group as timing waveform 128 pixels tall. This will look like an "Analog" waveform. |
| Hex | Display group in Hex format. Data must be Zoomed for display to work. |
| Binary | Display group in Binary format. Data must be Zoomed for display to work. |

Decimal Display group in Decimal format. Data must be Zoomed for display to work.

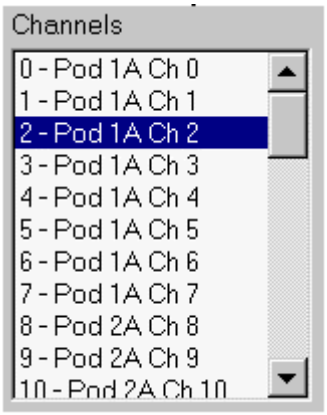
To change channel name or color hit Edit channel name/color. 


You can edit and create groups with Group setup. 


This window will appear when you click on Timing Setup in the Timing menu or when you click on the names in the Timing window.

## Adding a channel to the Timing display:

1. Select channel you want to add from the "channels" window:

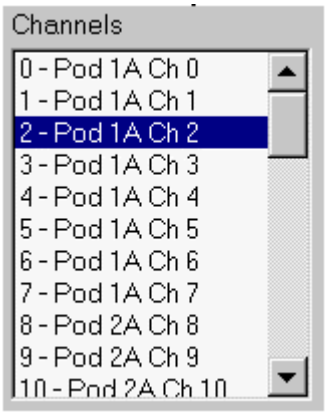



2. Click the "Append to list >>" button

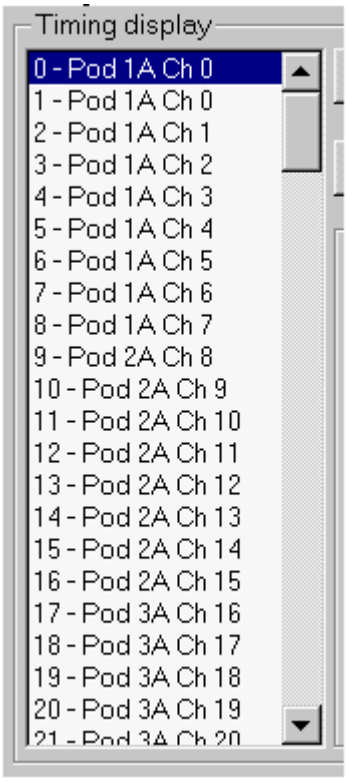

3. "Pod 1A Ch 2" will be added to the end of the list.

## Inserting a channel in the Timing display:

1. Select channel you want to add from the "channels" window:




2. Select the position, from the "Timing display" window, you want the channel inserted into:

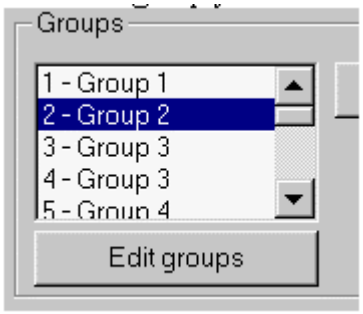



3. Click the "insert in list >>" button

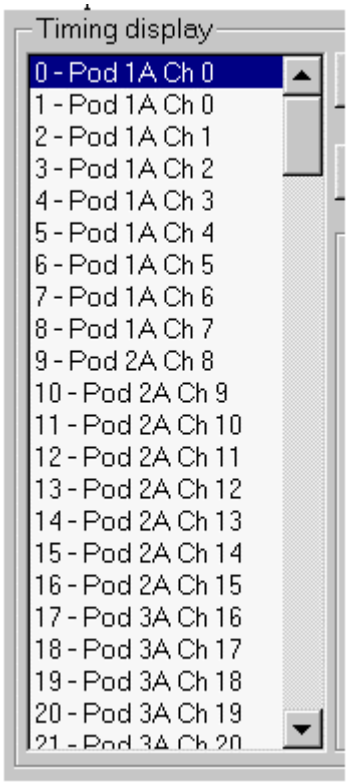
4. "Pod 1A Ch 2" will be added to the list before "Pod1A ch 0"

## Inserting a group in the Timing display:

1. Select the group you want to add from the "Group" window:




2. Select the position, from the "Timing display" window, you want the group inserted into:

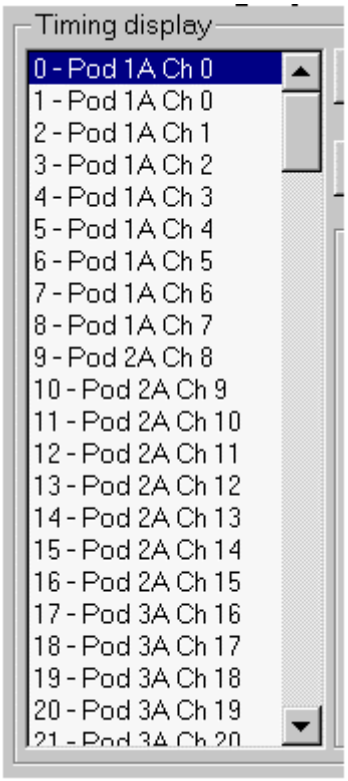



3. Click the "insert in list >>" button


4. "Group 2" will be added to the list before "Pod1A ch 0"

Deleting a channel or group from the Timing display:

1. Select the channel/group, from the "Timing display" window, you want to delete:




2. Click the "Delete ch. from list" button


3. "Pod 1A Ch 0" will be deleted from the list.

**Editing a channel name or color:**
1. Select Channel

2. Click on the "Edit channel names/colors" button

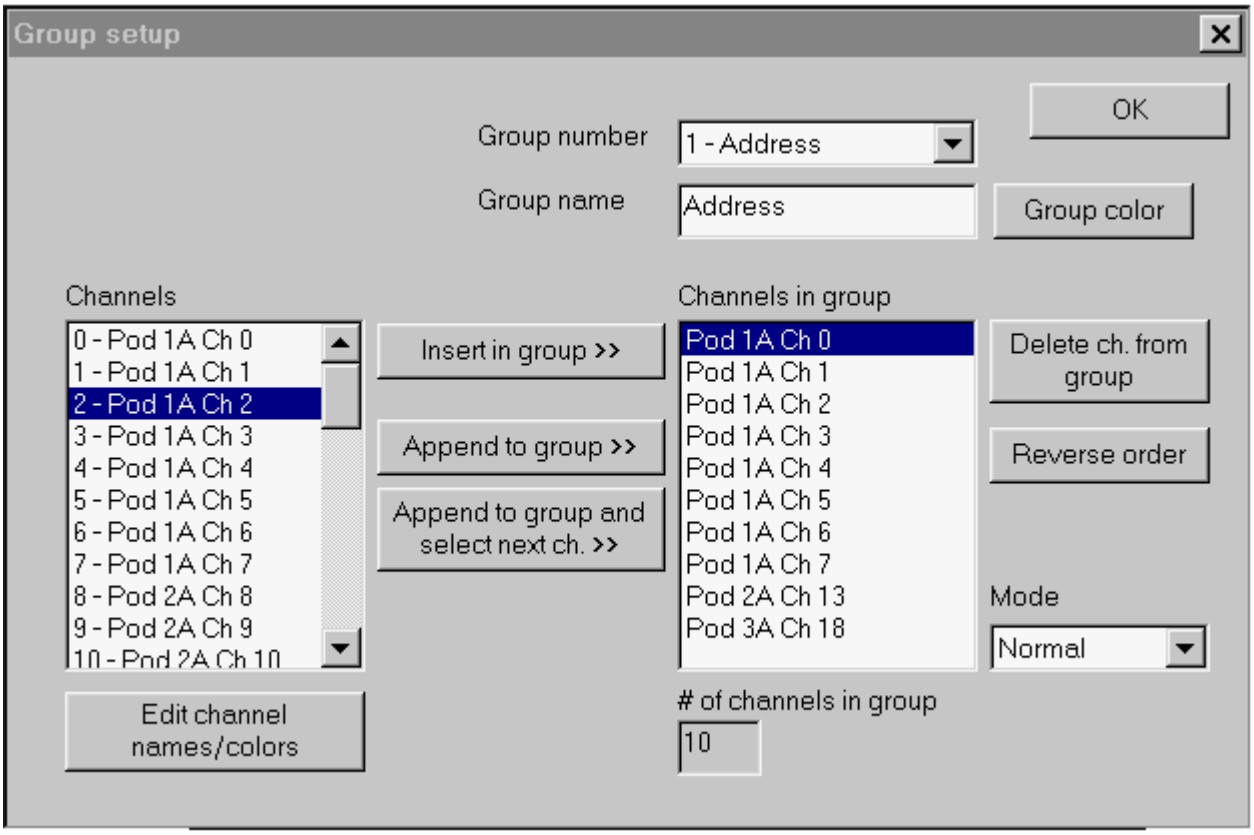
**Editing a group:**
1. Select the group
2. Click on the "Edit groups" button

You can activate this window from the timing menu or by clicking on the channel names in the timing display.

See also: How to (timing setup)

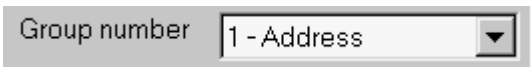
## Defining groups (how to)

The group define window is available in the Statelist pulldown menu.

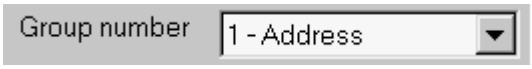



**Selecting a group**:

1. Use the Group number box to select a group

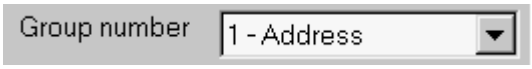


**Editing a group name**:
1. Select group.

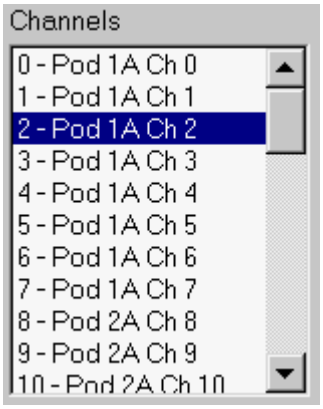



Edit name (14 character maximum).


**Adding a channel to a group**:
1. Select group.



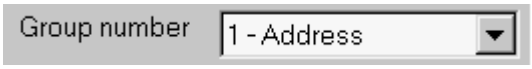

2. Select channel you want to add from the "channels" window:



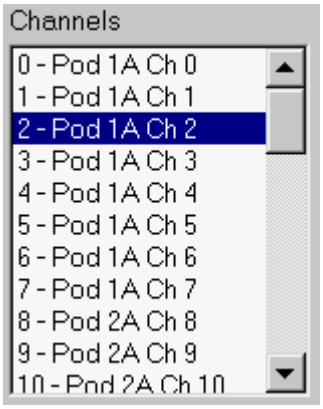

3. Click the "Append to group >>" button


4. "Pod 1A Ch 2" will be added to the end of the group.

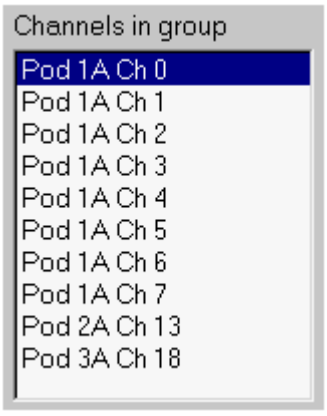
**Inserting a channel in a group**:
1. Select group.




2. Select channel you want to add from the "channels" window:




3. Select the position, from the "Channels in group" window, you want the channel inserted into:

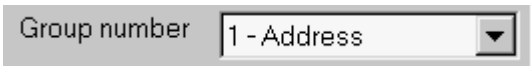



4. Click the "insert in group >>" button

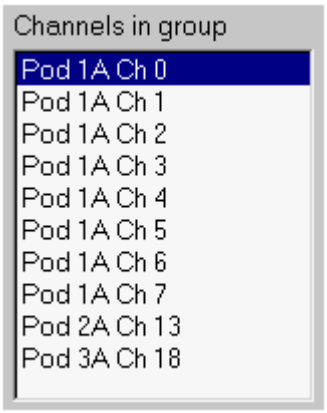
5. "Pod 1A Ch 2" will be added to the group before "Pod1A ch 0"

**Deleting a channel from a group**:

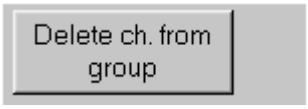
1.Select group.




2. Select the channel, from the "Channels in group" window, you want to delete:




3. Click the "Delete ch. from group" button




4. "Pod 1A Ch 0" will be deleted from the group

## Statelist vs. Timing windows

Timing window:

Displays data as horizontal waveforms or as horizontal numeric streams. Typically each line represents a single channel, but a group of channels can also be displayed.

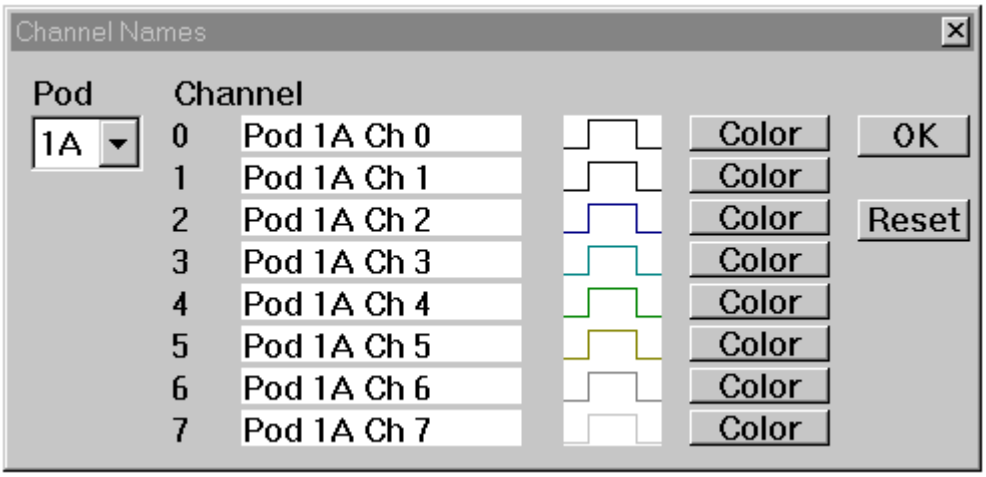
Statelist window:

Displays data as a vertical stream of data. The data is organized as a group of channels and is displayed in a numeric format. The groups are initially defined into groups of 8 channels. You can edit and define groups in the group define dialog box.

## Setting channel names and colors.

Channel names and colors dialog box can be seen by doing the following:

1. Timing/edit names and colors menu.
2. Statelist/edit names and colors menu.
3. Right clicking on the channel names in the Timing window.




Using the channel names/colors dialog box

1. Select the pod that you want has the channel that you want to edit.
2. Edit the channel name or hit the "color" button to bring up a color selection screen.

Save (File menu)

**Use this command to save and name a data file or settings file.**
**The** Save As dialog box **Is displayed so you can name your document.**

File types are the following:
.LA Data file Link Instruments file format for data and settings.
.INI Settings file Link Instruments file format for settings only.
.CSV Comma Separated Value Industry standard data file format. Use this to export data to excel, dbase and others
.PRN MathCad file Industry standard data file format. Use this to export data to mathcad and others
.LXT Translation table Link Instruments file format for translation tables.

See also: File/Export

File Save As dialog box

**The following options allow you to specify the name and location of the file you're about to save**:

File Name

Type a new file name to save a document with a different name. A file name can contain up to eight characters and an extension of up to three characters. The extension you specify in the Save File As Type box is added to the file name.

Drives

Select the drive in which you want to store the document.

Directories

Select the directory in which you want to store the document.

Network...

Choose this button to connect to a network location, assigning it a new drive letter.

## File formats

**Data files( .LA)**

This file contains settings in the traditional windows .INI format and 2 types of records in the following format:

1. Data

a header that starts with a `[` and ends with a `]' character. this header line must be less than 80 characters long. The line has 4 tokens

token 1: "Data"
token 2: channel ID A1,A2,D1,M1,M2.....
where A stands for analog channels, D stands for digital channels(8), and M for memory locations.
Example 1: D1 means the first 8 digital channels.
Example 2: A2 means the second analog channel
token 3: a six digit number for the start address of the data record. The number is coded in decimal.
token 4: a six digit number for the length of the data record. The number is coded in decimal (maximum length per record is 32768).

example "[Data D2 000000 004096]"
This line means load digital channels 8..15 with 4096 data points starting at address 0.

Following the data header will be the actual data stored in binary format.

2. Comment

A header that starts with a `[` and ends with a `]' character. this header line must be less than 80 characters long.

The line has 1 or more tokens.
token 1: "Comment"
token 2....: the comment

example "[Comment This file was saved on 1/1/1995 at 8:06]"

**Data files( .CSV from file save/load)**

Comma Separated Value files will have one or more channels worth of data separated by commas. This file format is used when you want a way to export data to other programs. Each line will represent one sample. Each channel will be separated by a comma. Each line must have the same number of commas.

example A)

1,1,0,0,1,1,1,1,
0,0,0,0,1,1,1,1,

In this example you have 2 samples each with 8 channels.

example B)

1,
0,
0,
0,
0,
1,
1,
1,
1,

In this example you have 9 samples each with 1 channel.

**Data files( .CSV from file export)**

Export can save a group or all channels. Comma Separated Value files will have one or more channels worth of data separated by commas. This file format is used when you want a way to export data to other programs. Each line will represent one sample.

All channels:

| | |
|---|---|
| Binary mode: | Each channel will be separated by a comma. |
| Decimal mode: | Data will be grouped by pod. Data will be in Decimal. Each pod worth of data will be separated by a comma. |
| Ascii mode: | Data will be grouped by pod. Data will be in Ascii. Each pod worth of data will be separated by a comma. |
| Hex mode: | Data will be grouped by pod. Data will be in Hex. Each pod worth of data will be separated by a comma. |

Group:

| | |
|---|---|
| Binary mode: | Each channel will be separated by a comma. |
| Decimal mode: | Data will be in Decimal. Each group worth of data will be separated by a comma. |
| Ascii mode: | Data will be in Ascii. Each group worth of data will be separated by a comma. |
| Hex mode: | Data will be in Hex. Each group worth of data will be |

separated by a comma.

**Settings file(.INI)**

These files store the Logic Analyzer settings. It is in the standard windows .INI format.

**Translation table(.LXT)**

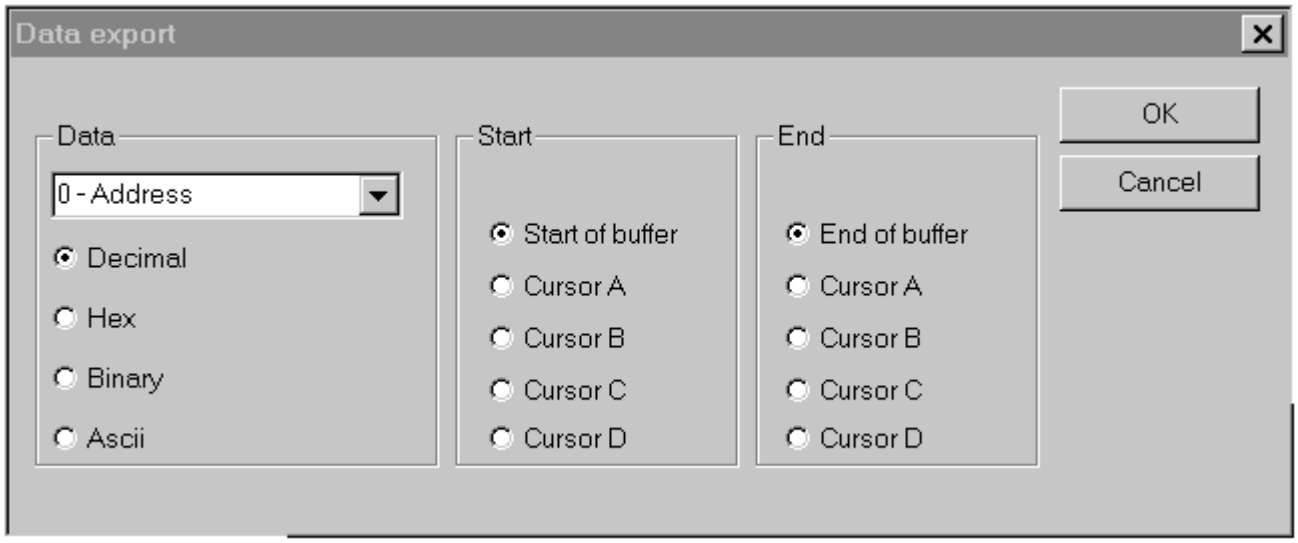
See Translation tables .

**MathCad( .PRN)**

This is the same as .CSV except it does not have the commas.

## Export (file menu)

Use this to output data to other programs.




**How to use:**

1) Data:
   Select which data to output: Individual group or all channels
   Select base to output data in.
2) Start and End:
   Select data address range.
3) Click OK to save data.

See also: File formats.

## File menu commands

The File menu offers the following commands:

| | |
|---|---|
| Load | Opens an existing file (data or settings). |
| Save | Saves a file to a specified file name. Saves settings or data files. |
| Export | Export data to other programs. |
| Auto save settings | If checked settings will be saved when you exit the program. |
| Quick save settings | Save settings to one of five predefined files. |
| Quick load settings | Load settings from one of five predefined files. |
| Delete Settings | Delete one of five predefined settings files. |

| | |
|---|---|
| Print | Prints data in Timing or Statelist format. |
| Print Preview | Displays the data on the screen as it would appear printed. |
| Print Setup | Selects a print mode, printer and printer connection. |
| Memory mode | Select memory/channel/speed mode. |
| Exit | Exit. |

See also: File formats

## Print command (File menu)

**Use this command to print a document. This command presents a Print dialog box, where you may specify the range of pages to be printed, the number of copies, the destination printer, and other printer setup options.**

Use print setup to define printout style and print range.

### Shortcuts

Toolbar: 

Keys: CTRL+P

*Print dialog box*

**The following options allow you to specify how the document should be printed**:

**Printer**

This is the active printer and printer connection. Choose the Setup option to change the printer and printer connection.

**Setup**

Displays a Print Setup dialog box, so you can select a printer and printer connection.

**Copies**

Specify the number of copies you want to print for the above page range.

**Collate Copies**

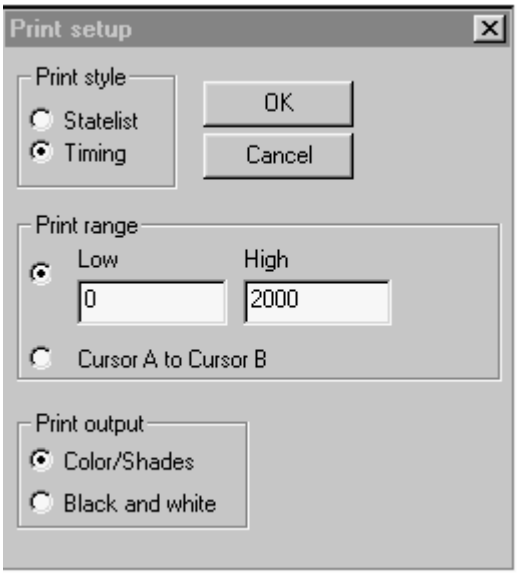
Prints copies in page number order, instead of separated multiple copies of each page.

**Print Quality**

Select the quality of the printing. Generally, lower quality printing takes less time to produce.

Print Setup command (File menu)

**1. Use this command select output style (statelist or timing), Data range and mode (color or B/W).**




**Print style:**

Select statelist or timing.

**Print range:**

| | |
|---|---|
| Low/High: | Specify data range to print. This range is in "Sample" units. See "Samples or Time" in View Menu. |
| Cursor A to Cursor B: | Print region between cursors A and B |

**Print output:**

Colors are often not printed well on some black and white printers. Choosing Black and white will make the software use a black instead of trying to use color.

**2. A second dialog box appears**( Print Setup dialog box ) **when this one closes, where you specify the printer and its connection.**

Print Setup dialog box

**The following options allow you to select the destination printer and its connection.**

**Printer**
Select the printer you want to use. Choose the Default Printer; or choose the Specific Printer option and select one of the current installed printers shown in the box. You install printers and configure ports using the Windows Control Panel.

**Orientation**
Choose Portrait or Landscape.

**Paper Size**
Select the size of paper that the document is to be printed on.

**Paper Source**
Some printers offer multiple trays for different paper sources. Specify the tray here.

**Options**
Displays a dialog box where you can make additional choices about printing, specific to the type of printer you have selected.

**Network...**
Choose this button to connect to a network location, assigning it a new drive letter.

## Edit menu commands

**The Edit menu offers the following commands:**

Copy Copies data from the document to the clipboard.

Copy command (Edit menu)

**Use this command to copy selected data onto the clipboard. This command is Unavailable if there Is no data currently selected.**
**Copying data to the clipboard replaces the contents previously stored there.**
**Shortcuts**

Toolbar: 

Keys: CTRL+C

Serial window

An optional I2C software package is available that allows you to view a disassembled I2C data capture. The screen looks very similar to the statelist window. The screen is organized in to two columns. The first column displays the address/sample time and the second column displays the I2C commands such as Read, Write, ACK, NACK, ADDR 1, ADDR 0, DATA 1, Data 0, Start, Stop, etc....
The serial window will disassemble a single group. This group be set to a mode "I2C" (See group define). and have two channels (Clock and data).

Contact **Link Instruments** sales department to order the I2C software.

## Pod Menu

Pod Mode setup — Select to configure the pods and to edit the pattern generator data and options

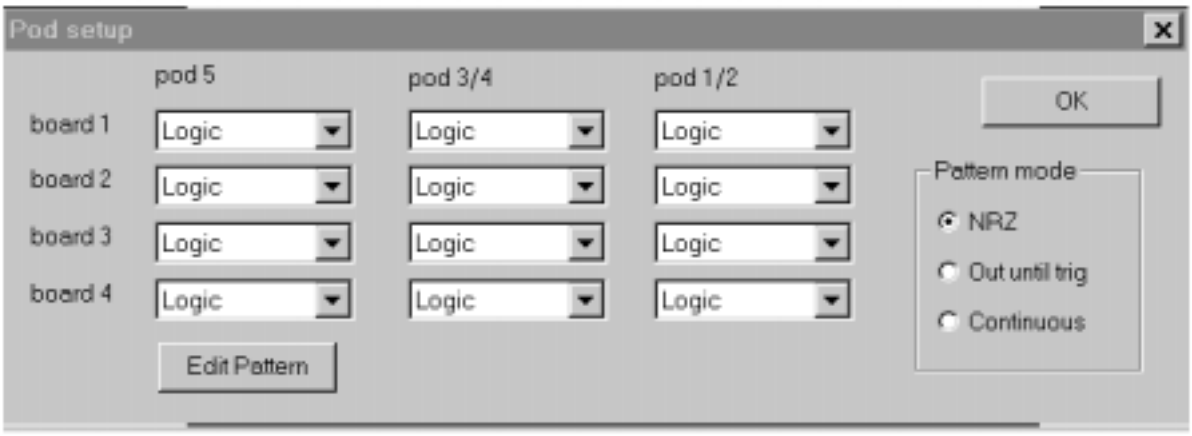
Edit pattern (Not available on LA-2124) — Select this to edit pattern generator data.

Threshold voltage — Set threshold voltage. Signals above the threshold voltage is evaluated as a "1" and signals below are "0".

## Pattern menu

The Logic Analyzer can be converted into a combination Logic Analyzer/Pattern Generator or to a Pattern Generator only. This is done by buying Pattern Generator pods, installing them instead of the Logic pods and then configuring the software. Three different modes can be set

| | |
|---|---|
| Logic | Install Logic pods and acquire data. |
| Pattern Generator | Install Pattern Generator pods and output data. |
| Off | Turn off pod connector on instrument and stop inputting/outputting data from that pod. |




Pattern mode:

| | |
|---|---|
| NRZ | Output pattern once. Data is acquired simultaneously on Logic pods. |
| Out until trig | Output until trigger condition met. Data is acquired simultaneously on Logic pods. |
| Continuous | Continuously output until stop hit. Data is not acquired simultaneously on Logic pods. |

How to:

1) Install pattern pods and select the matching configuration on the table above.
   Note: Pods 1 and 2 must be both either Pattern Generator or Logic Analyzer.

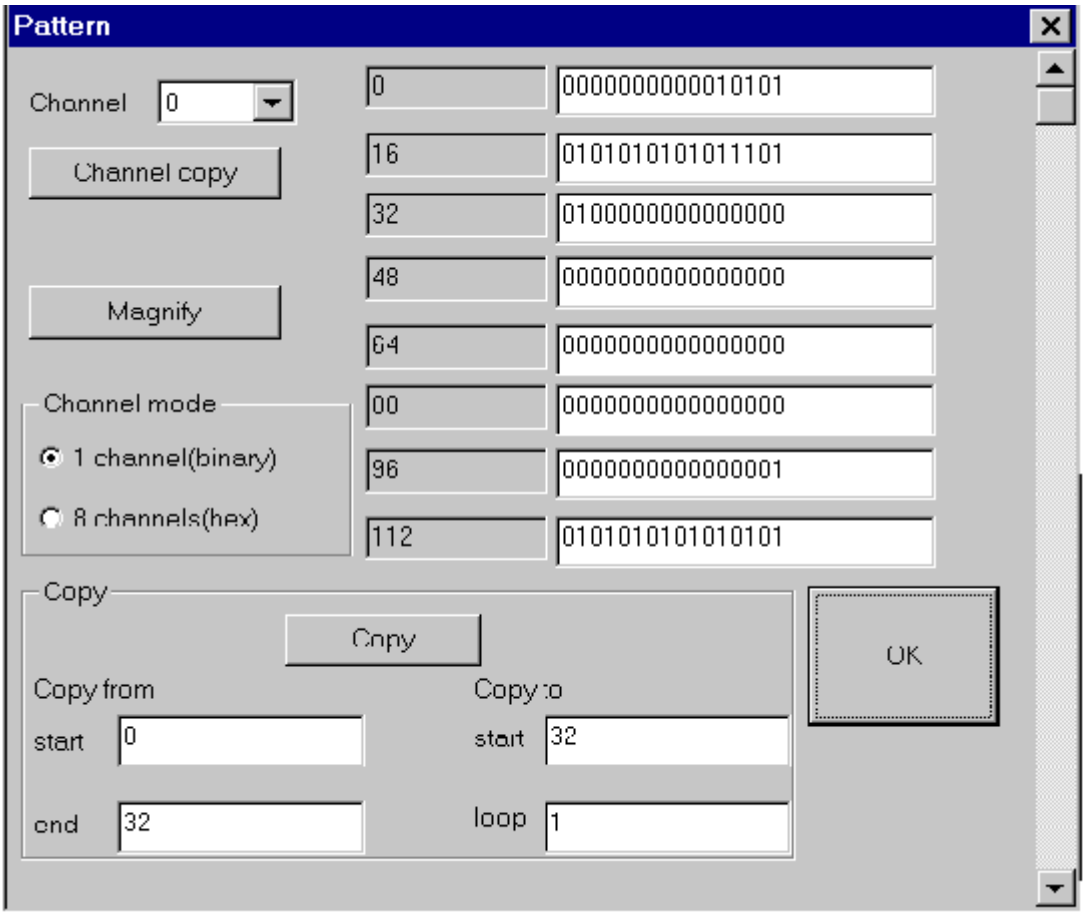
Pods 3 and 4 must also be the same type.

2) Select pattern output mode.

3) Edit the pattern.

## Pattern editor

Patterns can be edited and defined in this window. You can also get data for the pattern data by capturing it from logic channels and copying it to the pattern channels. Pattern data can also come from data files created by this software or files that you create yourself.




**Channel**

Select which channel(s) to edit.

**Channel copy**

Used to bring up a dialog box to copy entire channels.

**Channel mode**

Select 1 channel edit or 8 channel edit.

**Magnify**

Each time the key is hit the data is expanded by a factor of two. For example

0101100 becomes 00110011110000

**Copy**

Select "copy from" range, "copy to start" and number of times to "loop". Then hit the 'copy' key.
Example 1:
Copy from start = 20
Copy from end = 30
Copy to start = 50
loop = 1

When you click on the copy key the 11 data points from position 20 to and including position 30 in the data buffer will be copied to position 50.

Example 2:
Copy from start = 20
Copy from end = 30
Copy to start = 50
loop = 2

When you click on the copy key the 11 data points from position 20 to and including position 30 in the data buffer will be copied to position 50 to 60 and then from 61 to 71.

**Vertical scrollbar**

Use to scroll the data.

## Help menu commands

The Help menu offers the following commands, which provide you assistance with this application

| | |
|---|---|
| Help Topics | Offers you an index to topics on which you can get help. |
| About | Display copyright and version number of this application. |

## Index command (Help menu)

Use this command to display the opening screen of Help. From the opening screen, you can Jump to step-by-step instructions for using this program and various types of reference information. Once you open Help, you can click the Contents button whenever you want to return to the opening screen.

## About command (Help menu)

Use this command to display the copyright notice and version number of your copy of this program.

**Hot keys**

| | |
|---|---|
| Alt-F | File menu |
| Alt-E | Edit menu |
| Alt-V | View menu |
| Alt-R | Serial menu |
| Alt-A | State menu |
| Alt-I | Timing menu |
| Alt-P | Pattern menu |
| Alt-C | Clock menu |
| Alt-T | Trigger menu |
| Alt-S | Search menu |
| Alt-H | Help menu |

Timing window selected

Control click Zooms in on point clicked.
Shift click Zooms out on point clicked.

Left and right arrows scroll data with respect to time.
Up and down arrows scroll data with respect to channels.

Holding shift key down while using arrows will scroll by a factor of 10.
Holding control key down while using arrows will scroll by a factor of 100.
Holding shift and control keys down while using arrows will scroll by a factor of 1000.

Control A: Brings window to cursor.
Control B: Brings window to cursor.
Control C: Brings window to cursor.
Control D: Brings window to cursor.
Control T: Brings window to cursor.

Shift A: Brings cursor to window.
Shift B: Brings cursor to window.
Shift C: Brings cursor to window.
Shift D: Brings cursor to window.
Shift T: Brings cursor to window.

Note:

This only works on the selected window.
Click on the window to select it.
The selected window will say "active window" in the title bar.

State window selected

Up and down arrows scroll data with respect to time.
Left and right arrows scroll data with respect to channels.
Holding shift key down while using arrows will scroll by a factor of 10.
Holding control key down while using arrows will scroll by a factor of 100.
Holding shift and control keys down while using arrows will scroll by a factor of 1000.

Control A: Brings window to cursor.

Control B: Brings window to cursor.
Control C: Brings window to cursor.
Control D: Brings window to cursor.
Control T: Brings window to cursor.

Shift A: Brings cursor to window.
Shift B: Brings cursor to window.
Shift C: Brings cursor to window.
Shift D: Brings cursor to window.
Shift T: Brings cursor to window.

Note:
This only works on the selected window.
Click on the window to select it.
The selected window will say "active window" in the title bar.

Either window selected
Timing window (Right click)
Brings up zoom dialog box.
Allows you to zoom on center or left edge of screen.
Other zoom features.
Timing window (Left click on channel names)
Brings up Timing setup.
Statelist window (Left click on group names)
Brings up Statelist setup.
Cursor window (Right click)
Right clicking on check boxes will set the item to zero.

## Accessories

Pattern generator pods (Not available for the LA-2124)
Pattern generator pods can be purchased to convert the LA-4000 into a pattern generator. The mini DB-25 gender changer connect to LA-4000/LA-5000, it is parallel port based Logic Analyzers.

USB 2.0 adapter (Not available for the LA-2124)
An optional USB adapter is available for the LA-4000/LA5000 series Logic Analyzers. It allows you to run the Analyzer from the USB port of your computer instead of the ISA communications card.

ISA Communication cards (Not available for the LA-2124)
Extra communication cards are available for this Logic Analyzer. You can install these cards in multiple computers and easily move the Logic Analyzer from computer to computer. (Note: ISA bus Logic Analyzer LA-4000 are discontinue from September 2002)

Clips and wires
Extra clips and wires are available.

I2C software
An optional I2C software package is available that allows you to view a disassembled I2C data capture.

## Hardware/Software Specifications

**Note: From the date of September 2002 we do not supply the ISA bus for LA-4000/ LA-5000 Logic Analyzer**.

LA-com-card (ISA) for the LA-4000 series Logic Analyzers

Address jumper positions for ISA card.
Jumper address

| | 210-21F | | | 230-23F | | | 280-28F | | | 2A0-2AF | | | 300-30F | | | 320-32F | | | 380-38F | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 |
| JP1 | | X | X | X | X | | | X | X | X | X | | | X | X | X | X | | | X | X |
| JP2 | | X | X | | X | X | X | X | | X | X | | | X | X | | X | X | X | X | |
| JP3 | | X | X | | X | X | | X | X | | X | X | X | X | | X | X | | X | X | |

**Software (LA-4000 series - ISA BUS)**
**Operating systems supported**

| | |
|---|---|
| DOS: | Yes. |
| WIN3.1: | Use DOS version of the software. |
| WIN95/98/me: | Yes. |
| WIN NT/2000/XP: | Yes. **(ISA bus only)** |

**Software (LA-2124)**
**Operating systems supported**

| | |
|---|---|
| DOS: | Not supported. |
| WIN3.1: | Not supported. |
| WIN95/98/ME: | A version for win 95/98 is now available. |
| WIN NT/2000/XP: | Not available yet. |

## Memory modes and channel specs

### Memory mode

Select memory mode: Available Channels

**LA-2124-128K**
Max speed channels (memory size)
up to 50MHz external 24 (24 @ 128K each) All channels available
up to 100MHz internal 24 (24 @ 128K each) All channels available

**LA-4240-32K**
Max speed channels (memory size)
up to 50MHz external 40 (40 @32K each) All channels available

up to 100MHz internal 40 (40 @32K each) All channels available
100MHz 40 (40 @100MHz @32K)
200MHz 24 (16 @200MHz @64K, 8@100MHz @32K) Pods 1a, 2a are at 200MHz, Pods 3a, 4a are off. Pod 5a is at 100MH

**LA-5540-256K**
Max speed channels (memory size)
up to 80MHz external 40 (40 @128K each) All channels available
up to 250MHz internal 40 (40 @256K each) All channels available
500MHz 24 (24 @500MHz @512K) Pods 1a, 3a, 5a are at 500MHz, Pods 2a, 4a are off.

**LA-4280-32K**
Max speed channels (memory size)
up to 50MHz external 80 (80 @32K each) All channels available
up to 100MHz internal 80 (80 @32K each) All channels available
100MHz 80 (80 @100MHz @32K)
200MHz 32 (32 @200MHz @64K,16@100MHz 32K) Pods 1a, 2a & 1b, 2b, are at 200MHz, Pods 3a, 4a & 3b, 4b are off. Pods 5a & 5b are100MHz.

**LA-5580-256K**
Max speed channels (memory size)
up to 80MHz external 80 (80 @ 128K each) All channels available
up to 250MHz internal 80 (80 @ 256K each) All channels available
500MHz 48 (48 @500MHz @512K) Pods 1a, 3a, 5a & 1b, 3b, 5b are at 500MHz, Pods 2a, 4a & 2b, 4b are off.

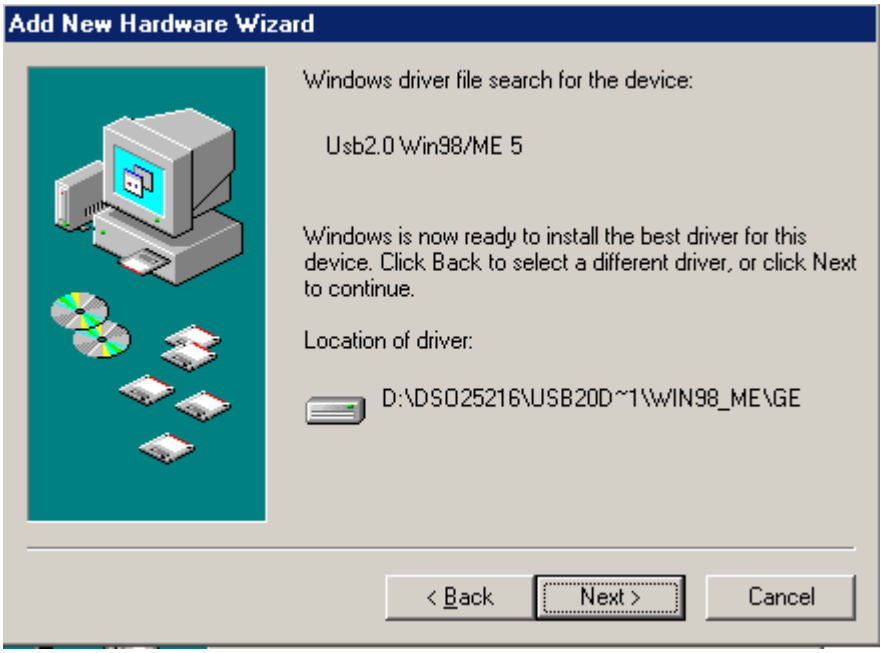
**LA-55160-256K**
Max speed channels (memory size)
up to 80MHz external 160 (160 @ 128K each) All channels available
up to 250MHz internal 160 (160 @ 256K each) All channels available
500MHz 96 (96 @500MHz @512K) Pods 1a, 3a, 5a, 1b, 3b, 5b, 1c, 3c, 5c & 1d, 3d, 5d are at 500MHz, Pods 2a, 4a 2b, 4b, 2c, 4c, & 2d, 4d are off

## Windows 98/ME USB driver install

When USB2.0 control interface be connected to computer, screen will display


Click Next to continue


Edit or browse path to ...\USB20driver\win98_ME\gene.inf
(here D: is CD location, dso25216 may be dso29xx or la5000)
Click Next to continue




Click Next to continue


Completing install

## Technical Support

Technical support can be reached at
Clock Computer Corp.
7/F., No: 5. Lane 236, Section 5.
Roosevelt Road. Taipei. 116. Taiwan.
Phone: 886-2-29321685. 29340273. 29335954.
Fax: 886-2-29331687.
Email: ufclockc@ms9.hinet.net

## Software Updates

Software can be downloaded from our website
Web: www.clock-link.com.tw

Link Instruments Inc.
17A, Daniel Road East
Fairfield, NJ 07004 U.S.A.

Phone: 973-808-8990 (9:00 - 5:00 eastern standard time)
Fax: 973-808-8786
Email: support@LinkInstruments.com
Web: www.LinkInstruments.com

## Frequently Asked Questions

Q. The Logic Analyzer is working accept one of the channels is dead.
A. Check to see if the wire is actually on the post. It is possible to jam the wire between the post and the plastic case and not make a connection.
Q. Does the Logic Analyzer have an external trigger in?
A. You can use any/all of the inputs as a trigger signal.