
Help Volume

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**Display: Distribution Display
Tool**



The Distribution Tool displays an overview of program activity in a bar-graph form. Each bar may represent a single value or a range of values. The height of each bar represents the number of times the value occurred during the measurement.

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Using the Distribution Tool

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Zooming In and Out on the Distribution

NOTE:

When you zoom in and out on the distribution, the axes are automatically rescaled.

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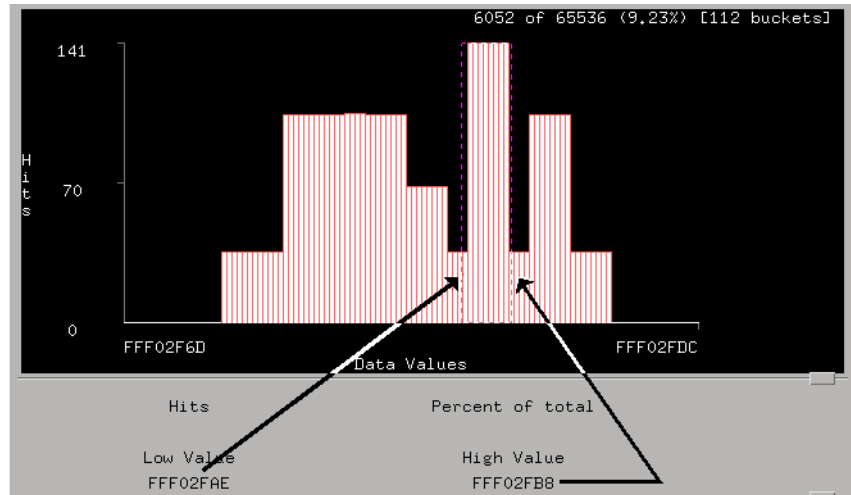
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To Zoom In on an Area of the Distribution

1. Point to the left edge of the area you want to zoom in on.
Read the data value that the mouse is pointing to from the *Low Value* field.
2. Press and hold the left mouse button and drag the mouse pointer to the right edge of the area you want to zoom in on.
Read the upper data value from the *High Value* field.
3. Release the mouse button when the upper value matches the upper bound of the area of interest.
The distribution is now rescaled to display the area you selected.

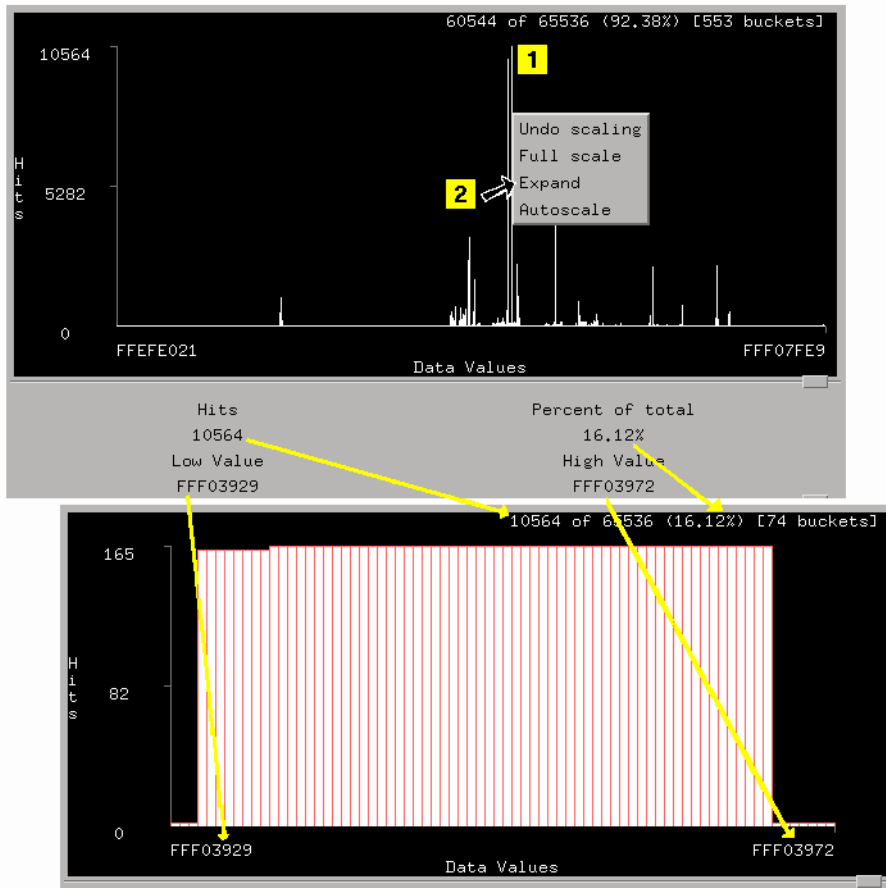


Zooming in on an area

To Zoom In on a Single Bin (Expand)

1. Right-click the bin you want to zoom in on.
Read the data value that the mouse is pointing to from the *Low Value* field.
2. Select *Expand*.
The bounds on the x-axis are now rescaled to the low value and high value of the bin you expanded.

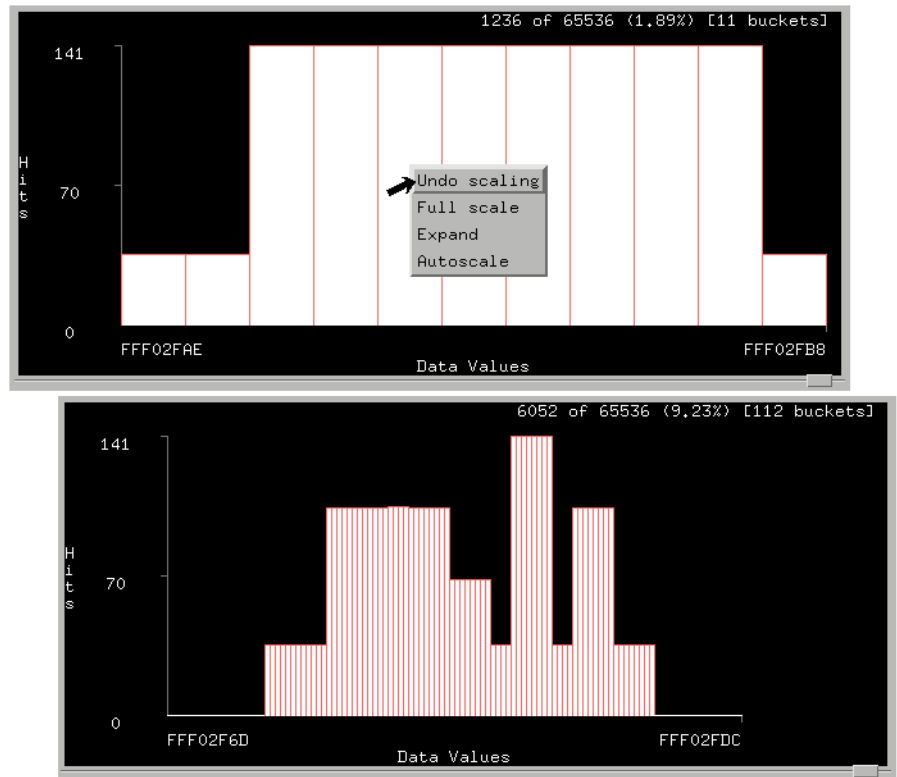
Chapter 1: Using the Distribution Tool Zooming In and Out on the Distribution



Zooming in on a single bin

To Zoom Out after Zooming In (Undo Scaling)

1. Right-click in the distribution display area.
2. Select *Undo scaling* from the shortcut menu.

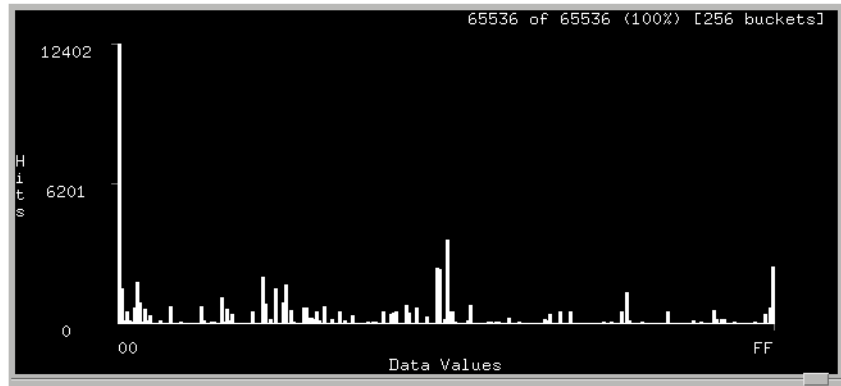
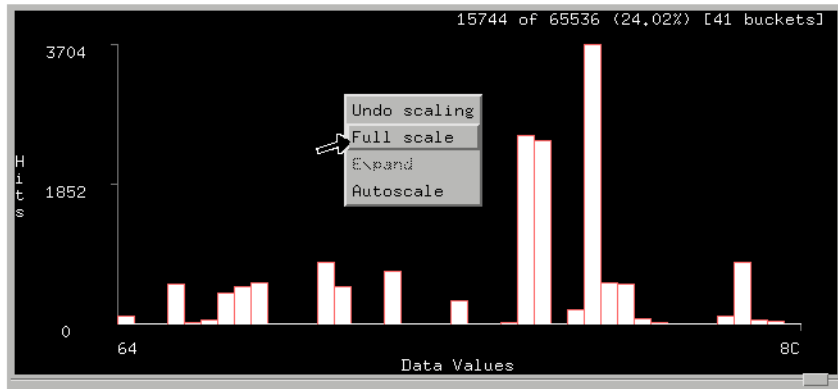


Zooming out

To View the Entire Distribution (Full scale)

The *Full scale* option scales the distribution to show the maximum range of possible values based on the number of bits in the label. For example, if an 8-bit label is displayed using Full scale, the distribution will show values from 00 hex to FF hex.

1. Right-click in the distribution display area.
2. Select *Full scale* from the shortcut menu.

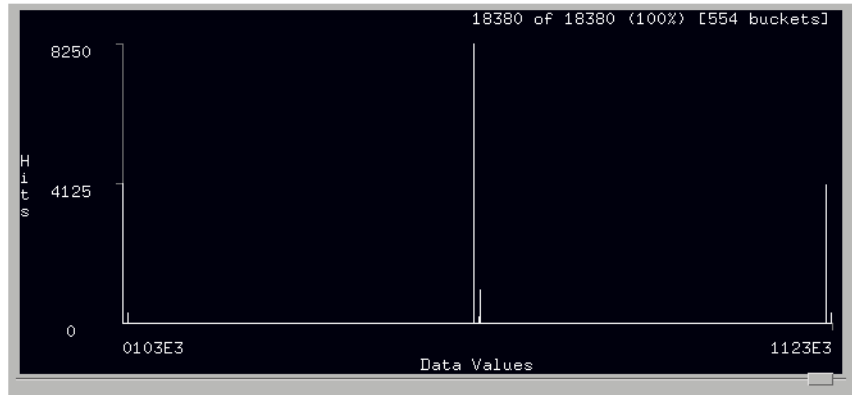
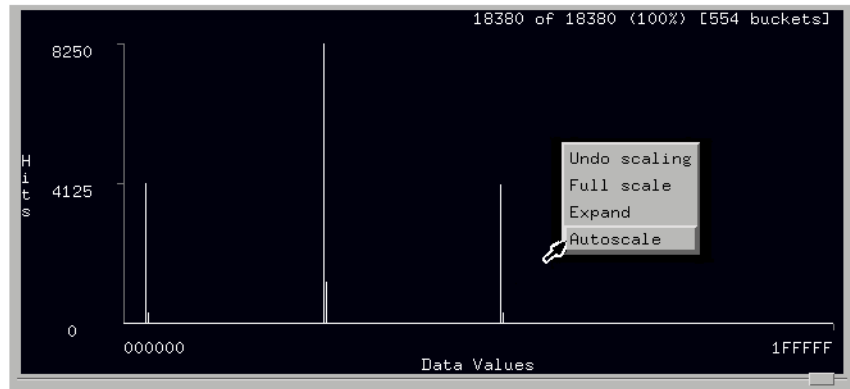


Zooming out to display the entire distribution

To Scale the Distribution to the Range of Values Present (Autoscale)

The *Autoscale* option scales the distribution to show all of the data in the current acquisition.

1. Right-click in the distribution display area.
2. Select *Autoscale* from the shortcut menu.
The distribution is rescaled to display the full range of data values.



Using Autoscale to rescale the distribution

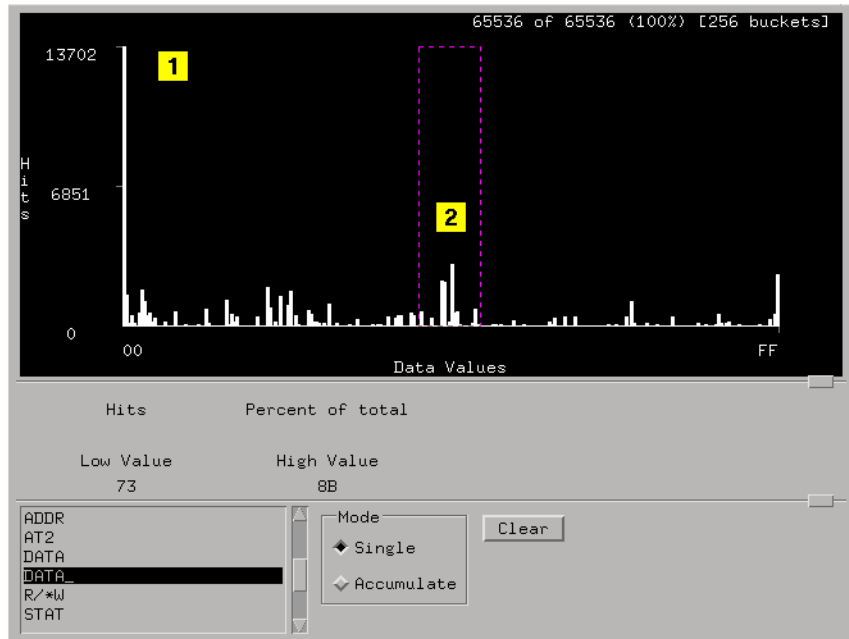
Checking the Number of Occurrences of a Data Value or Range

1. Zoom in (see page 8) on the distribution around the area of interest.
2. At the top of the distribution, read the total number of data points in the range you zoomed in on.
You can also see what percentage of the total number of data points fall within the range.
3. If necessary, continue to rescale the distribution (see page 8) to pinpoint the area of interest.
4. For information about a particular bin, place the cursor on the bin and read the details below the display.

Click here to see an example (see page 14)

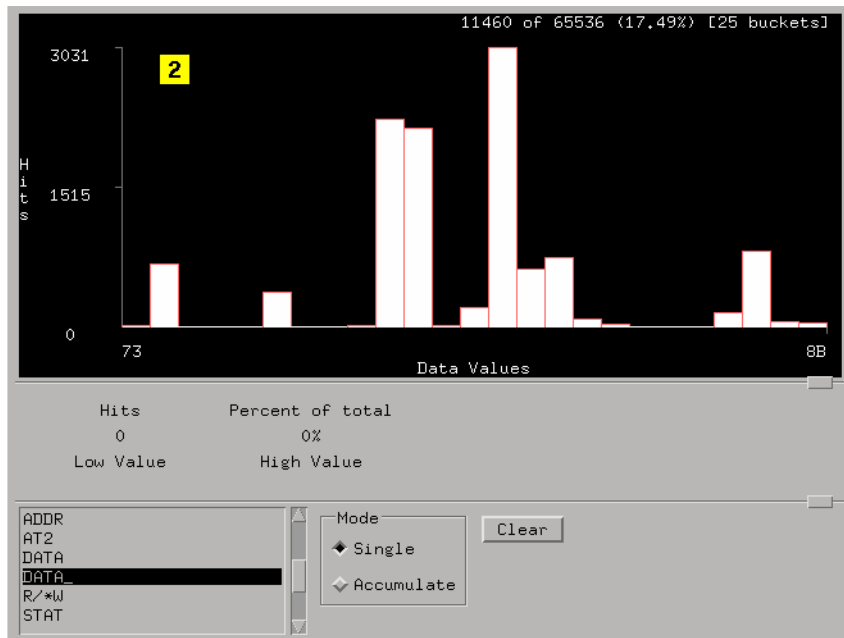
Example: Checking the Number of Occurrences of a Data Value or Range

1. A full-scale display shows all 65536 data points in the acquisition.
2. The distribution is rescaled to show activity in the range from 73 hex to 8B hex.

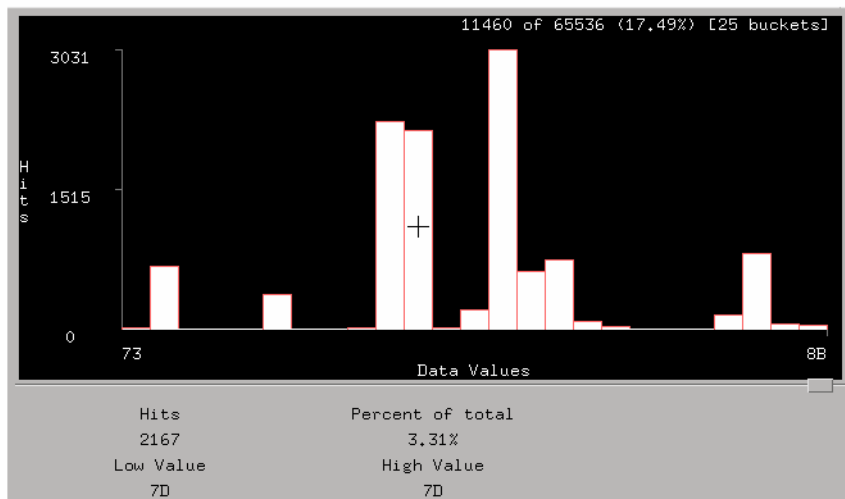


There are 11460 data points, or hits, in the rescaled range (17.49% of all hits recorded). The rescaled view shows how the data points are distributed.

Checking the Number of Occurrences of a Data Value or Range



The "+" cursor lets you examine the detail of any single value in the distribution. Value 7D recorded 2167 hits, which was 3.31% of all hits recorded during the measurement.



Optimizing Program Execution

The distribution measurement tool can detect procedures that consume too much execution time. For example, you may have a program that runs much longer than you expect. You make a distribution measurement and find that one small range of address space is used much more than any other. You see that this address range contains an update subroutine. Now you can make a measurement of that update subroutine and view it in a listing display to see why it is running such a long time. Perhaps you find it is making an excessive number of calls to another routine before it recognizes that the called routine is active. You modify your code to correct this problem, and thereby reduce execution time of your program.

1. Select the label (see page 23) that corresponds to your memory addresses. This is typically label *ADDR*.
2. Zoom in (see page 8) on the distribution to view the address range of interest.
 - The highest bars on the distribution represent addresses that occurred most often.
 - The lowest bars represent addresses that occurred least often.

Click here to see an example (see page 17)

Example: Finding a Procedure That Executes Too Long

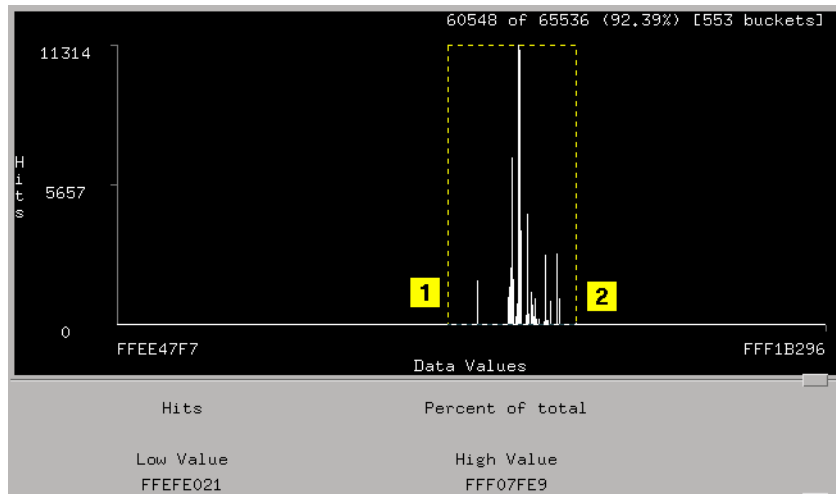
This screen shows an address range of FFEE47F7 through FFF1B296. This address range was involved in 92.39% of all activity measured during program execution. You can see that only a small portion of the address range actually was involved in program execution.

To zoom in on the active area:

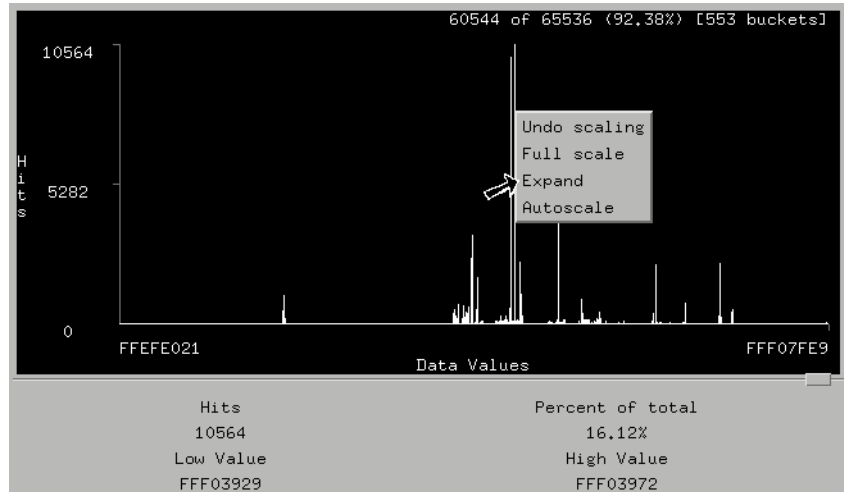
Chapter 1: Using the Distribution Tool

Optimizing Program Execution

1. The cursor was placed on address FFEFE021 and the left mouse button was pressed.
2. The zoom window was dragged to address FFF07FE9 and the left mouse button was released.
The selected range was shown full screen, as seen in the display following this one.



This display shows several bars of different heights, indicating address ranges where activity was recorded. The longest bar represents address range FFF03929 through FFF03972. In that single address range, 10,564 hits were recorded. This was 16.12% of all the hits that were recorded in all address ranges combined during program execution. Because so many hits were recorded in that one range, it will be expanded to see if there might be something to be learned about it.

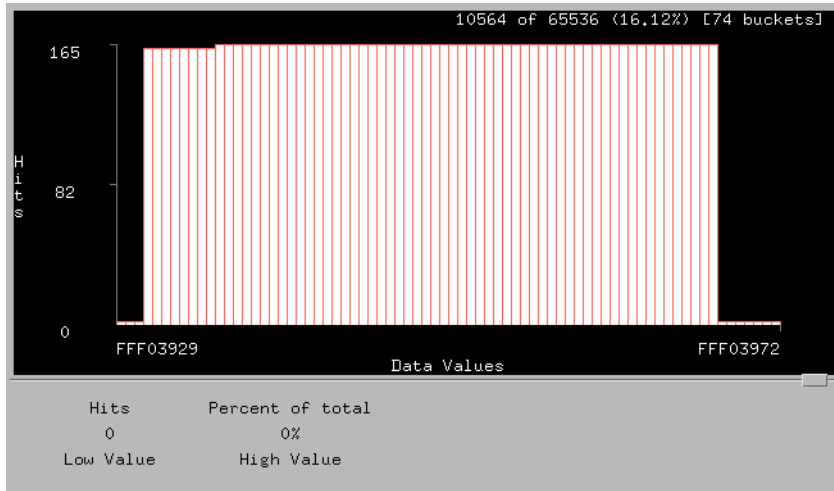


The address range FFF03929 through FFF03972 is expanded in the following screen. The most active addresses within this range received 165 hits each. Perhaps if you looked in this address range, you would find a subroutine that was called often by many different routines. Perhaps, instead, you would find a subroutine that was looping within itself and should not be representing this much activity.

To see the details of this address range, you could make a measurement and view results using the listing tool. You could set up the analyzer to trigger on address FFF03929 so you could see which routines call this subroutine and whether or not it should be consuming such a large percentage of the program execution.

You might make a second measurement with the analyzer, qualifying only addresses in the range FFF03929 through FFF03972. This would use analyzer memory most efficiently because it would allow you to capture only execution within this range of interest. Unfortunately, using a measurement qualification like this might exclude the calls to this address range that are generated by other routines.

Chapter 1: Using the Distribution Tool Optimizing Program Execution



Seeing Distributions of Multiple Acquisitions (Accumulate)

The *Accumulate* function allows the Distribution tool to accumulate data from a series of acquisitions. You can use this feature to measure your system's behavior over a long period of time.

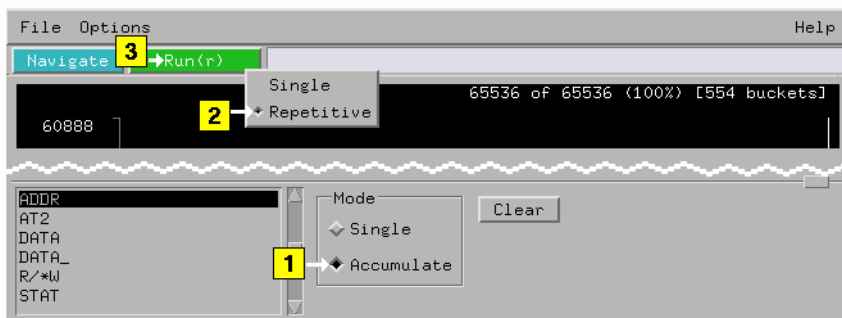
CAUTION:

Data acquired and displayed in accumulate mode will be lost if you rescale the distribution, or if you select a different label to view distribution.

1. Click *Accumulate* at the bottom of the Distribution window.
2. Right-click *Run* and select *Repetitive*.
3. Click *Run(r)* to start the continuous acquisition.
4. Click *Stop* when you have accumulated enough data.
The total number of data points accumulated is displayed in the upper right-hand corner of the distribution area.

NOTE:

There is some latency between the continuous runs of the analyzer when it is acquiring data. You may want to set up the analyzer to trigger and stop at the same points in each acquisition so that each run captures the same states.



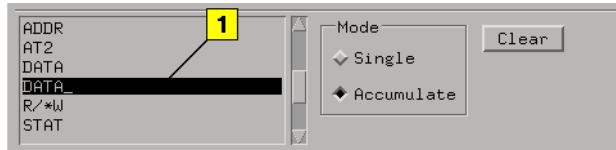
Changing the Color of the Distribution

1. Click *Options* in the Distribution window menu bar, and select *Color*.
2. Select the color you want, and click *OK*.
If the color you want is not shown, click *Edit Colors* (see page 31) to create the color you want.
3. Click *OK* to accept your changes or *Cancel* to preserve the former settings.



Choosing the Label for Distribution Display

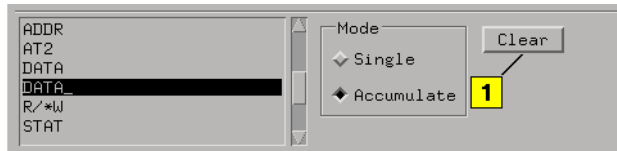
- Click the label you want in the label list at the bottom of the Distribution window.



Clearing the Data

Clearing the Data

- Click *Clear* at the bottom of the Distribution window.



Loading and Saving Distribution Configurations

Distribution Tool settings can be saved to a configuration file along with the tools connected to it, and loaded from a previously saved configuration file.

- Loading Configuration Files (see the *HP 16600A/16700A Logic Analysis System* help volume)
- Saving Configuration Files (see the *HP 16600A/16700A Logic Analysis System* help volume)

NOTE:

The *Load Configuration* window can be accessed via File->Load Configuration.

The *Save Configuration* window can be accessed via File->Save Configuration.

Printing the Distribution Window

The print windows operation enables you to print just the Distribution tool window. Use this operation if you want a hardcopy or electronic record of configurations and data currently displayed in the viewing area of the Distribution window.

NOTE:

Only the currently displayed viewing area of the Distribution window is printed. If any data or configuration fields appear offscreen, scroll the desired data or configuration fields into the window's viewing area before printing.

1. Optional - configure the Print Option (see the *HP 16600A/16700A Logic Analysis System* help volume) if desired.
Print Options include print destination, file format type, filename autoincrement, and color/b&w; pixel mapping.
2. In the Distribution tool menu bar, click *File*, then select *Print This Window*. The print output will be as configured in the Print Options in step 1.

See Also

Print Option (see the *HP 16600A/16700A Logic Analysis System* help volume)

Printer Setup (see the *HP 16600A/16700A Logic Analysis System* help volume)

“Including Comments on Screen Prints” on page 30

Printing the Distribution to a File

This operation prints the Distribution Tool data to an ASCII file.

1. From the Distribution tool's menu bar click *File*, then select *Print to file*.
2. Select the path and filename to print the data to. Use either the File Selection dialog to build the directory path and filename, or type the path and filename directly into the text entry field.
3. Click *Save*. Filenames can only include the following alphanumeric characters:
0-9, a-z, A-Z, (-), (_), (.), (/), (\$), (:), and (+).

The following is an example of a stored print file:

```
Distribution(Distribution<1>) - 22 January 1998 (12:15:44)
```

```
C9 - C9 18  
CA - CA 16  
CB - CB 16  
CC - CC 14  
CD - CD 18  
CE - CE 16  
CF - CF 16  
D0 - D0 20  
D1 - D1 32  
D2 - D2 28  
D3 - D3 36  
D4 - D4 28  
D5 - D5 33  
D6 - D6 28  
D7 - D7 39  
D8 - D8 28  
D9 - D9 36  
DA - DA 32  
DB - DB 32  
DC - DC 28  
DD - DD 32  
DE - DE 28  
DF - DF 36
```

Seeing Measurement Results - Popup on Run

By default, measurement results do not pop up automatically when an analyzer completes its run. If you wish to have a display of measurement results pop up when a run is completed, do the following:

- Click *Options* in the menu bar and select *Popup on Run* and *On*.

Turning Tabs On or Off in the Display Window

The tabs in the display window give you quick access and visual reference to all the capabilities in the display window. You may wish to turn the tabs off to simplify display content.

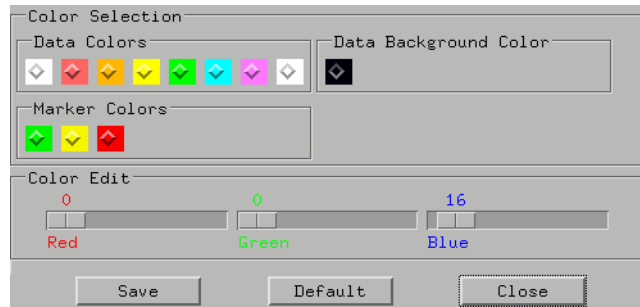
- Click *Options* in the menu bar and select *Tabs* and *On* or *Off*.

Including Comments on Screen Prints

When you have tabs turned on, you can also enter your own comments on screen. This allows you to obtain a printed copy of your screen that includes your comments.

- Turn tabs on, (see page 29) and under the *Tabs On* option, select *Stack comments*.
- Enter the text you wish to see in the print of your display. Each print can include multiple comment lines. If you need more than the default two comment lines, resize the comment text window using the sash.

Editing Colors



To edit a color

1. Click a color to change.
2. Move the *Color Edit* sliders to obtain the desired colors.
The colors change in the display to show the result of your modifications.
3. Click *Save* to accept and use the new colors, and save them as the powerup default colors.
Optional - Click *Default* to restore the original HP colors and save them as the powerup default colors.
4. Click *Close*.

Editing Colors

Glossary

absolute Denotes the time period or count of states between a captured state and the trigger state. An absolute count of -10 indicates the state was captured ten states before the trigger state was captured.

acquisition Denotes one complete cycle of data gathering by a measurement module. For example, if you are using an analyzer with 128K memory depth, one complete acquisition will capture and store 128K states in acquisition memory.

analysis probe A probe connected to the target microprocessor. It provides an interface between the signals of the target microprocessor and the inputs of the logic analyzer. Also called a "preprocessor".

analyzer 1 In a logic analyzer with two *machines*, refers to the machine that is on by default. The default name is *Analyzer<N>*, where N is the slot letter.

analyzer 2 In a logic analyzer with two *machines*, refers to the machine that is off by default. The default name is *Analyzer<N2>*, where N is the slot letter.

arming An instrument tool must be armed before it can search for its trigger condition. Typically,

instruments are armed immediately when *Run* or *Group Run* is selected. You can set up one instrument to arm another using the *Intermodule Window*. In these setups, the second instrument cannot search for its trigger condition until it receives the arming signal from the first instrument. In some analyzer instruments, you can set up one analyzer *machine* to arm the other analyzer machine in the *Trigger Window*.

asterisk (*) See *edge terms*, *glitch*, and *labels*.

bits Bits represent the physical logic analyzer channels. A bit is a *channel* that has or can be assigned to a *label*. A bit is also a position in a label.

card This refers to a single instrument intended for use in the HP 16600A-series or HP 16700A mainframe. One card fills one slot in the mainframe. A module may comprise a single card or multiple cards cabled together.

channel The entire signal path from the probe tip, through the cable and module, up to the label grouping.

click To click an item, position the cursor over the item. Then quickly press and release the *left mouse*

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button.

clock channel A logic analyzer *channel* that can be used to carry the clock signal. When it is not needed for clock signals, it can be used as a *data channel*, except in the HP 16517A.

context record A context record is a small segment of analyzer memory that stores an event of interest along with the states that immediately preceded it and the states that immediately followed it.

context store If your analyzer can perform context store measurements, you will see a button labeled *Context Store* under the Trigger tab. Typical context store measurements are used to capture writes to a variable or calls to a subroutine, along with the activity preceding and following the events. A context store measurement divides analyzer memory into a series of context records. If you have a 64K analyzer memory and select a 16-state context, the analyzer memory is divided into 4K 16-state context records. If you have a 64K analyzer memory and select a 64-state context, the analyzer memory will be divided into 1K 64-state records.

count The count function records

periods of time or numbers of state transactions between states stored in memory. You can set up the analyzer count function to count occurrences of a selected event during the trace, such as counting how many times a variable is read between each of the writes to the variable. The analyzer can also be set up to count elapsed time, such as counting the time spent executing within a particular function during a run of your target program.

cross triggering Using intermodule capabilities to have measurement modules trigger each other. For example, you can have an external instrument arm a logic analyzer, which subsequently triggers an oscilloscope when it finds the trigger state.

data channel A *channel* that carries data. Data channels cannot be used to clock logic analyzers.

data field A data field in the pattern generator is the data value associated with a single label within a particular data vector.

data set A data set is made up of all labels and data stored in memory of any single analyzer machine or instrument tool. Multiple data sets can be displayed together when sourced into a single display tool. The

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Filter tool is used to pass on partial data sets to analysis or display tools.

debug mode See *monitor*.

delay The delay function sets the horizontal position of the waveform on the screen for the oscilloscope and timing analyzer. Delay time is measured from the trigger point in seconds or states.

demo mode An emulation control session which is not connected to a real target system. All windows can be viewed, but the data displayed is simulated. To start demo mode, select *Start User Session* from the Emulation Control Interface and enter the demo name in the *Processor Probe LAN Name* field. Click *Help* in the *Start User Session* window for details.

deskewing To cancel or nullify the effects of differences between two different internal delay paths for a signal. Deskewing is normally done by routing a single test signal to the inputs of two different modules, then adjusting the Intermodule Skew so that both modules recognize the signal at the same time.

don't care For *terms*, a "don't care" means that the state of the signal (high or low) is not relevant to the

measurement. The analyzer ignores the state of this signal when determining whether a match occurs on an input label. "Don't care" signals are still sampled and their values can be displayed with the rest of the data. Don't cares are represented by the *X* character in numeric values and the dot (.) in timing edge specifications.

dot (.) See *edge terms*, *glitch*, *labels*, and *don't care*.

double-click To double-click an item, position the cursor over the item, and then quickly press and release the *left mouse button* twice.

drag and drop To drag and drop an item, position the cursor over the item, and then press and hold the *left mouse button*. While holding the left mouse button down, move the mouse to drag the item to a new location. When the item is positioned where you want it, release the mouse button.

edge mode In an oscilloscope, this is the trigger mode that causes a trigger based on a single channel edge, either rising or falling.

edge terms Logic analyzer trigger resources that allow detection of transitions on a signal. An edge term can be set to detect a rising edge,

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falling edge, or either edge. Some logic analyzers can also detect no edge or a *glitch* on an input signal. Edges are specified by selecting arrows. The dot (.) ignores the bit. The asterisk (*) specifies a glitch on the bit.

emulation module A module within the logic analysis system mainframe that provides an emulation connection to the debug port of a microprocessor. An E5901A emulation module is used with a target interface module (TIM) or an analysis probe. An E5901B emulation module is used with an E5900A emulation probe.

emulation probe The stand-alone equivalent of an *emulation module*. Most of the tasks which can be performed using an emulation module can also be performed using an emulation probe connected to your logic analysis system via a LAN.

emulator An *emulation module* or an *emulation probe*.

Ethernet address See *link-level address*.

events Events are the things you are looking for in your target system. In the logic analyzer interface, they take a single line. Examples of events

are *Label1 = XX* and *Timer 1 > 400 ns*.

filter expression The filter expression is the logical *OR* combination of all of the filter terms. States in your data that match the filter expression can be filtered out or passed through the Pattern Filter.

filter term A variable that you define in order to specify which states to filter out or pass through. Filter terms are logically *OR*'ed together to create the filter expression.

Format The selections under the logic analyzer *Format* tab tell the logic analyzer what data you want to collect, such as which channels represent buses (labels) and what logic threshold your signals use.

frame The HP 16600A-series or HP 16700A logic analysis system mainframe. See also *logic analysis system*.

gateway address An IP address entered in integer dot notation. The default gateway address is 0.0.0.0, which allows all connections on the local network or subnet. If connections are to be made across networks or subnets, this address must be set to the address of the

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gateway machine.

glitch A glitch occurs when two or more transitions cross the logic threshold between consecutive timing analyzer samples. You can specify glitch detection by choosing the asterisk (*) for *edge terms* under the timing analyzer Trigger tab.

grouped event A grouped event is a list of *events* that you have grouped, and optionally named. It can be reused in other trigger sequence levels. Only available in HP 16715A, 16716A, and 16717A logic analyzers.

held value A value that is held until the next sample. A held value can exist in multiple data sets.

immediate mode In an oscilloscope, the trigger mode that does not require a specific trigger condition such as an edge or a pattern. Use immediate mode when the oscilloscope is armed by another instrument.

interconnect cable Short name for *module/probe interconnect cable*.

intermodule Intermodule is a term used when multiple instrument tools are connected together for the purpose of one instrument arming another. In such a configuration, an

arming tree is developed and the group run function is designated to start all instrument tools. Multiple instrument configurations are done in the Intermodule window.

intermodule bus The intermodule bus (IMB) is a bus in the frame that allows the measurement modules to communicate with each other. Using the IMB, you can set up one instrument to *arm* another. Data acquired by instruments using the IMB is time-correlated.

internet address Also called Internet Protocol address or IP address. A 32-bit network address. It is usually represented as decimal numbers separated by periods; for example, 192.35.12.6. Ask your LAN administrator if you need an internet address.

labels Labels are used to group and identify logic analyzer channels. A label consists of a name and an associated bit or group of bits. Labels are created in the Format tab.

line numbers A line number (Line #s) is a special use of *symbols*. Line numbers represent lines in your source file, typically lines that have no unique symbols defined to represent them.

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link-level address Also referred to as the Ethernet address, this is the unique address of the LAN interface. This value is set at the factory and cannot be changed. The link-level address of a particular piece of equipment is often printed on a label above the LAN connector. An example of a link-level address in hexadecimal: 0800090012AB.

local session A local session is when you run the logic analysis system using the local display connected to the product hardware.

logic analysis system The HP 16600A-series or HP 16700A mainframe, and all tools designed to work with it. Usually used to mean the specific system and tools you are working with right now.

machine Some logic analyzers allow you to set up two measurements at the same time. Each measurement is handled by a different machine. This is represented in the Workspace window by two icons, differentiated by a *1* and a *2* in the upper right-hand corner of the icon. Logic analyzer resources such as pods and trigger terms cannot be shared by the machines.

markers Markers are the green and yellow lines in the display that are

labeled *x*, *o*, *G1*, and *G2*. Use them to measure time intervals or sample intervals. Markers are assigned to patterns in order to find patterns or track sequences of states in the data. The *x* and *o* markers are local to the immediate display, while *G1* and *G2* are global between time correlated displays.

master card In a module, the master card controls the data acquisition or output. The logic analysis system references the module by the slot in which the master card is plugged. For example, a 5-card HP 16555D would be referred to as *Slot C: machine* because the master card is in slot C of the mainframe. The other cards of the module are called *expansion cards*.

menu bar The menu bar is located at the top of all windows. Use it to select *File* operations, tool or system *Options*, and tool or system level *Help*.

message bar The message bar displays mouse button functions for the window area or field directly beneath the mouse cursor. Use the mouse and message bar together to prompt yourself to functions and shortcuts.

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module An instrument that uses a single timebase in its operation. Modules can have from one to five cards functioning as a single instrument. When a module has more than one card, system window will show the instrument icon in the slot of the *master card*.

module/probe interconnect cable

The module/probe interconnect cable connects an E5901B emulation module to an E5900B emulation probe. It provides power and a serial connection. A LAN connection is also required to use the emulation probe.

monitor When using the Emulation Control Interface, running the monitor means the processor is in debug mode (that is, executing the debug exception) instead of executing the user program.

panning The action of moving the waveform along the timebase by varying the delay value in the Delay field. This action allows you to control the portion of acquisition memory that will be displayed on the screen.

pattern mode In an oscilloscope, the trigger mode that allows you to set the oscilloscope to trigger on a specified combination of input signal

levels.

pattern terms Logic analyzer resources that represent single states to be found on labeled sets of bits; for example, an address on the address bus or a status on the status lines.

period (.) See *edge terms*, *glitch*, *labels*, and *don't care*.

pod See *pod pair*

pod pair A group of two pods containing 16 channels each, used to physically connect data and clock signals from the unit under test to the analyzer. Pods are assigned by pairs in the analyzer interface. The number of pod pairs available is determined by the channel width of the instrument.

point To point to an item, move the mouse cursor over the item.

preprocessor See *analysis probe*.

primary branch The primary branch is indicated in the *Trigger sequence step* dialog box as either the *Then find* or *Trigger on* selection. The destination of the primary branch is always the next state in the sequence, except for the HP 16517A. The primary branch has an optional occurrence count field

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that can be used to count a number of occurrences of the branch condition. See also *secondary branch*.

probe A device to connect the various instruments of the logic analysis system to the target system. There are many types of probes and the one you should use depends on the instrument and your data requirements. As a verb, "to probe" means to attach a probe to the target system.

processor probe See *emulation probe*.

range terms Logic analyzer resources that represent ranges of values to be found on labeled sets of bits. For example, range terms could identify a range of addresses to be found on the address bus or a range of data values to be found on the data bus. In the trigger sequence, range terms are considered to be true when any value within the range occurs.

relative Denotes time period or count of states between the current state and the previous state.

remote display A remote display is a display other than the one connected to the product hardware. Remote displays must be identified to the network through an address

location.

remote session A remote session is when you run the logic analyzer using a display that is located away from the product hardware.

right-click To right-click an item, position the cursor over the item, and then quickly press and release the *right mouse button*.

sample A data sample is a portion of a *data set*, sometimes just one point. When an instrument samples the target system, it is taking a single measurement as part of its data acquisition cycle.

Sampling Use the selections under the logic analyzer Sampling tab to tell the logic analyzer how you want to make measurements, such as State vs. Timing.

secondary branch The secondary branch is indicated in the *Trigger sequence step* dialog box as the *Else on* selection. The destination of the secondary branch can be specified as any other active sequence state. See also *primary branch*.

session A session begins when you start a *local session* or *remote session* from the session manager, and ends when you select *Exit* from

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the main window. Exiting a session returns all tools to their initial configurations.

skew Skew is the difference in channel delays between measurement channels. Typically, skew between modules is caused by differences in designs of measurement channels, and differences in characteristics of the electronic components within those channels. You should adjust measurement modules to eliminate as much skew as possible so that it does not affect the accuracy of your measurements.

state measurement In a state measurement, the logic analyzer is clocked by a signal from the system under test. Each time the clock signal becomes valid, the analyzer samples data from the system under test. Since the analyzer is clocked by the system, state measurements are *synchronous* with the test system.

store qualification Store qualification is only available in a *state measurement*, not *timing measurements*. Store qualification allows you to specify the type of information (all samples, no samples, or selected states) to be stored in memory. Use store qualification to prevent memory from being filled

with unwanted activity such as no-ops or wait-loops. To set up store qualification, use the *While storing* field in a logic analyzer trigger sequence dialog.

subnet mask A subnet mask blocks out part of an IP address so that the networking software can determine whether the destination host is on a local or remote network. It is usually represented as decimal numbers separated by periods; for example, 255.255.255.0. Ask your LAN administrator if you need a the subnet mask for your network.

symbols Symbols represent patterns and ranges of values found on labeled sets of bits. Two kinds of symbols are available:

- Object file symbols - Symbols from your source code, and symbols generated by your compiler. Object file symbols may represent global variables, functions, labels, and source line numbers.
- User-defined symbols - Symbols you create.

Symbols can be used as *pattern* and *range* terms for:

- Searches in the listing display.

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- Triggering in logic analyzers and in the source correlation trigger setup.
- Qualifying data in the filter tool and system performance analysis tool set.

system administrator The system administrator is a person who manages your system, taking care of such tasks as adding peripheral devices, adding new users, and doing system backup. In general, the system administrator is the person you go to with questions about implementing your software.

target system The system under test, which contains the microprocessor you are probing.

terms Terms are variables that can be used in trigger sequences. A term can be a single value on a label or set of labels, any value within a range of values on a label or set of labels, or a glitch or edge transition on bits within a label or set of labels.

TIM A TIM (Target Interface Module) makes connections between the cable from the emulation module or emulation probe and the cable to the debug port on the system under test.

timer terms Logic analyzer resources that are used to measure the time the trigger sequence remains within one sequence step, or a set of sequence steps. Timers can be used to detect when a condition lasts too long or not long enough. They can be used to measure pulse duration, or duration of a wait loop. A single timer term can be used to delay trigger until a period of time after detection of a significant event.

time-correlated Time correlated measurements are measurements involving more than one instrument in which all instruments have a common time or trigger reference.

timing measurement In a timing measurement, the logic analyzer samples data at regular intervals according to a clock signal internal to the timing analyzer. Since the analyzer is clocked by a signal that is not related to the system under test, timing measurements capture traces of electrical activity over time. These measurements are *asynchronous* with the test system.

tools A tool is a stand-alone piece of functionality. A tool can be an instrument that acquires data, a display for viewing data, or a post-processing analysis helper. Tools are represented as icons in the main

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window of the interface.

toolbox The Toolbox is located on the left side of the main window. It is used to display the available hardware and software tools. As you add new tools to your system, their icons will appear in the Toolbox.

tool icon Tool icons that appear in the workspace are representations of the hardware and software tools selected from the toolbox. If they are placed directly over a current measurement, the tools automatically connect to that measurement. If they are placed on an open area of the main window, you must connect them to a measurement using the mouse.

trace See *acquisition*.

trigger Trigger is an event that occurs immediately after the instrument recognizes a match between the incoming data and the trigger specification. Once trigger occurs, the instrument completes its *acquisition*, including any store qualification that may be specified.

trigger sequence A trigger sequence is a sequence of events that you specify. The logic analyzer compares this sequence with the samples it is collecting to determine when to *trigger*.

trigger specification A trigger specification is a set of conditions that must be true before the instrument triggers.

workspace The workspace is the large area under the message bar and to the right of the toolbox. The workspace is where you place the different instrument, display, and analysis tools. Once in the workspace, the tool icons graphically represent a complete picture of the measurements.

zooming In the oscilloscope or timing analyzer, to expand and contract the waveform along the time base by varying the value in the s/Div field. This action allows you to select specific portions of a particular waveform in acquisition memory that will be displayed on the screen. You can view any portion of the waveform record in acquisition memory.

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