

Using Tools

Online Help



Notices

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CAUTION

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Using Tools—At a Glance

The tools accessed through the **Tools** menu allow you to process captured data before you view it.

Some tools are supplied with the logic analyzer. Other tools can be purchased from Agilent or from other companies.

• To install a tool (see page 7)

Some of the tools you are likely to use include:

- Filter/Colorize Tool (see page 13)
- Inverse Assembly Tools (see page 9)
- Bus Analysis Tools (see page 11)
- "Using the Serial To Parallel Tool" (in the online help)
- "Using the Signal Extractor Tool" (in the online help)
- "Using the Signal Inserter Tool" (in the online help)
- **See Also** To develop your own tools (see page 41)

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- **3** Using Bus Analysis Tools

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5 Using the Packet Decoder Tool

6 To develop your own tools

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- 1 To install a new tool, run the setup program on the tool's installation CD-ROM by selecting **Start>Settings>Control Panel>Add/Remove Programs**.
- **2** Once the files have been installed, you may need to "license" (in the online help) the tool.
- **3** To use the new tool in a measurement, "add" (in the online help) it to the measurement configuration.

If you ordered the tool with your Agilent Technologies logic analyzer, the tool should already be installed and licensed.

See Also

- "To install a program from a CD-ROM" in the Windows help
 - "To activate software licenses" (in the online help)
 - "To add, duplicate, or delete windows and tools" (in the online help)



To install a tool



Inverse assembler tools help you view captured bus activity as assembly language mnemonics.

To use an inverse assembler, you will usually need to:

- **1** Design logic analyzer connectors into your target system, or use an analysis probe.
- **2** Install (see page 7) and "license" (in the online help) the inverse assembler software.
- **3** Load a configuration. The configuration sets up buses and signals, adds an inverse assembly and a filter/colorize tool, and defines symbols.
- 4 Configure the inverse assembler to work with your target system.
- 5 Capture and view your data.

Inverse assembly tools lock the buses and signals that they use to create the mnemonics. Locked buses and signals cannot be deleted or renamed, although they can be turned off in the viewers. A locked bus or signal has a gray icon to the left of the name instead of a red one.

Inverse assembler tool online help is installed with the tool.

"ARM Inverse Assembler" (in the online help)

"Freescale MXC Memory Bus Decoder" (in the online help)

"Arm11 ETM Decoder" (in the online help)

"Freescale StarCore140/3400 Nexus Decoder and Inverse Assembler" (in the online help)

"ARM AHB Inverse Assembler" (in the online help)

"ARM7/9 ETM Inverse Assembler" (in the online help)

"Motorola 6833x/7x Inverse Assembler" (in the online help)

"Pentium[®] 4/Xeon™ Transaction Tracker" (in the online help)

"Intel 80486 Inverse Assembler" (in the online help)

"Itanium[®] 2 Transaction Tracker" (in the online help)

"IBM PowerPC 405 Inverse Assembler" (in the online help)



"Low Pin Count Bus Decoder" (in the online help)

"Freescale M-CORE Nexus Decoder and Inverse Assembler" (in the online help)

"Xilinx MicroBlaze 4 Inverse Assembler" (in the online help)

"Xilinx MicroBlaze 5 Inverse Assembler" (in the online help)

"Motorola MPC74xx 60xbus Inverse Assembler" (in the online help)

"Motorola MPC74xx MPXbus Inverse Assembler" (in the online help)

"Freescale MPC555 Inverse Assembler" (in the online help)

"Motorola PowerQUICC II (MPC8260) Inverse Assembler" (in the online help)

"SDRAM Decoder" (in the online help)

"Motorola PowerQUICC III (MPC85xx) GPCM Inverse Assembler" (in the online help)

"Motorola PowerQUICC III (MPC85xx) DDR Inverse Assembler" (in the online help)

"Motorola PowerQUICC (MPC8XX) Inverse Assembler" (in the online help)

"PowerPC 6xx/7xx Inverse Assembler" (in the online help)

"IBM PowerPC 405 Trace Port Decoder and Inverse Assembler" (in the online help)

NOTE

You may find help for additional inverse assembler tools by clicking on the Contents tab on the left side of this window, and then expanding Using Tools and Using Inverse Assembler Tools (by clicking their "+"). Help for inverse assemblers from other companies is listed under the company name.

See Also

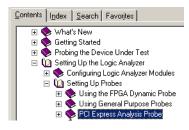
- To install a tool (see page 7)
- "To add, duplicate, or delete windows and tools" (in the online help)
- "Setting Up Symbols" (in the online help)



Bus analysis tools help you interpret bus activity in terms of network or bus protocols.

NOTE

Help for any bus analysis tools which have been installed on your logic analyzer can be found by selecting **Help>Help On Probes** from the menu bar, or in the Contents tab of this help window, under Setting Up the Logic Analyzer:



See Also • Using the Packet Decoder Tool (see page 39)



Using Bus Analysis Tools



The Filter/Colorize tool lets you show, hide, or color certain samples from a data acquisition module or tool before they are passed on to a display window (for example, Waveform, Listing, etc.) or another tool.

- To add a new Filter/Colorize tool (see page 14)
- To specify bus/signal patterns to filter (see page 16)
- To specify packet patterns to filter (see page 19)
- To insert or delete pattern events (see page 23)
- To insert or delete filter clauses (see page 24)
- To name filter clauses (see page 27)
- To disable or enable filter clauses (see page 28)
- To change the "across all data" option (see page 29)
- To store favorite Filter/Colorize tool setups (see page 32)
- To recall favorite Filter/Colorize tool setups (see page 33)
- To delete favorite Filter/Colorize tool setups (see page 34)
- To disable or enable a Filter/Colorize tool (see page 35)
- To rename a Filter/Colorize tool (see page 36)
- To delete a Filter/Colorize tool (see page 37)
- **See Also** The Filter/Colorize Tool vs. Filtering in the Trigger (see page 38)



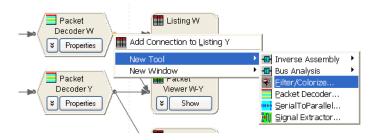
4 Using the Filter/Colorize Tool

To add a new Filter/Colorize tool

1 From the *Agilent Logic Analyzer* application's main menu, select **Tools>New Filter/Colorize...**, specify its location in the New Tool dialog, and click **OK**:

New Tool			X
Add Filter/Colorize:			
After Analyzer W	~	Before Packet Decoder W	~
ОК		Cancel	

Or, in the Overview window, right-click at the location you want to add the the tool and choose **New Tool>Filter/Colorize...**:



2 In the Filter/Colorize dialog, select the type of filter:

Filter/Colori	ze-1	×
Color V	when	
Show Hide Color	ignal 🔽 8bbyte0 All bits 💌 =	
<		
Store Favorite	Recall Favorite OK Cancel	Help

You can choose to **Show**, **Hide**, or **Color** the samples that match the bus/signal pattern(s).

- **3** Specify the bus/signal pattern (see page 16) or packet pattern (see page 19) to filter.
- 4 Click **OK** to apply the filter.

See Also • To insert or delete pattern events (see page 23)

- To insert or delete filter clauses (see page 24)
- To name filter clauses (see page 27)
- To disable or enable filter clauses (see page 28)
- To store favorite Filter/Colorize tool setups (see page 32)
- To recall favorite Filter/Colorize tool setups (see page 33)
- To delete favorite Filter/Colorize tool setups (see page 34)
- To disable or enable a Filter/Colorize tool (see page 35)
- To rename a Filter/Colorize tool (see page 36)
- To delete a Filter/Colorize tool (see page 37)

To specify bus/signal patterns to filter

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, select the Bus/Signal pattern type.

Color V 📕 w	hen
🗧 Bus/Signal 👻	8bbyte0 All bits 💙 = 💙 🖓
Bus/Signal Packet	
Packet Error Field	

3 Select the bus or signal.

Color 🔽 💻	💌 when		
🗧 Bus/Signal	8bbyte0	💙 All bits 🔽 =	🗸 🕅 Hex 🕈

Clicking lets you select from recently used bus/signal names. Clicking elsewhere on a bus/signal name button opens a Select dialog for selecting a different name.

4 If a bus has been selected, either select **All bits** on the bus or select an individual bit.



5 Specify the bus/signal value:

If a signal or one bit of a bus has been selected, select the signal pattern value (**High**, **Low**, or **Dont Care**).



If all bits of a bus have been selected:

a Select one of the operators: = (equal to), != (not equal to), < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), In Range, or Not In Range.

		_
Color 🖌 🔲 when		
🔻 Bus/Signal 👻 🛛 8bbyte0 🛛 All bits 💟	- *	Г
	!=	
	<	
	>	
	<=	
	>=	
	In Range	
	Not In Range	

 b Select the number base (Binary, Hex, Octal, Decimal, Signed Decimal, also known as two's complement, Ascii, or Symbol).

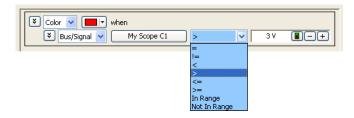
al v Sbbyte0 All bits v = v 🖾 🖩	Hex ¥
	Binary
	✓ Hex
	Octal
	Decimal
	Signed Decimal
	Ascii
	Symbol

c Enter the pattern value(s).

When the **Symbol** number base is selected, you use the "Select Symbol dialog" (in the online help) to specify the pattern values.

If an analog signal has been selected:

a Select one of the operators: = (equal to), != (not equal to), < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), In Range, or Not In Range.



b Enter the voltage value(s).

See Also • To insert or delete pattern events (see page 23)

To specify packet patterns to filter

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:

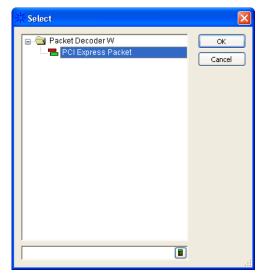


2 In the Filter/Colorize dialog, select the **Packet**, **Packet Error**, or **Field** pattern type.

S Color V when				
Packet	PCI Express Packet Any Packet			
Bus/Signal				
Packet				
Packet Error Field	r			

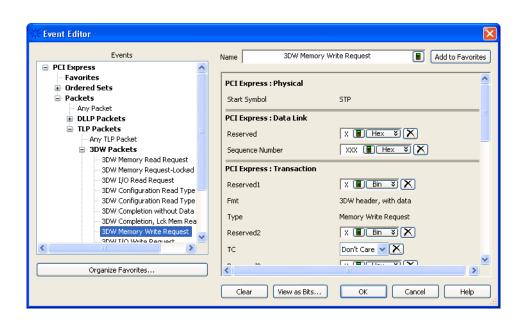
- For the Packet pattern type ... (see page 19)
- For the Packet Error pattern type ... (see page 20)
- For the Field pattern type ... (see page 21)

For the Packet 1 You can click packet type button to open a selection dialog. pattern type ...



2 Click the packet event button to open the Event Editor dialog.

4 Using the Filter/Colorize Tool



For more information, see "Using the Packet Event Editor" (in the online help)

You can click packet type button to open a selection dialog.

For the Packet Error pattern type

1

...

Select

2 Select the packet error value:



For the Field 1 Select the field name. pattern type ...

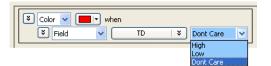
Color	v 🔳) when		
× F	ield	Completion Statu ¥	- *	X Hex ¥

Clicking $\boxed{}$ lets you select from recently used field names. Clicking elsewhere on a field name button opens a Select dialog for selecting a different name.



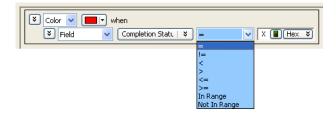
2 Specify the field value:

If a single-bit field has been selected, select the signal pattern value (High, Low, or Dont Care).

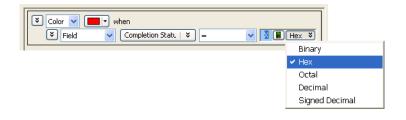


If a multiple-bit field has been selected:

a Select one of the operators: = (equal to), != (not equal to), < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), In Range, or Not In Range.



b Select the number base (Binary, Hex, Octal, Decimal, or Signed Decimal, also known as two's complement).



c Enter the pattern value(s).

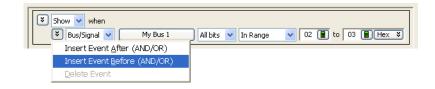
See Also • To insert or delete pattern events (see page 23)

To insert or delete pattern events

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, at a pattern event, click the [™] button associated with an event, and choose Insert Event After (AND/OR), Insert Event Before (AND/OR), or Delete Event.



3 Specify whether the event should be **And**'ed or **Or**'ed with the other events.

S Color when	
🗧 😵 Bus/Signal 👻 8bbyte0 🛛 🛠 All bits 💌 =	XX 🖩 Hex 🐳 And 🗸
Sus/Signal Subbyte0 Subbyte0 =	XX Hex V And Or

- **See Also** To specify bus/signal patterns to filter (see page 16)
 - To specify packet patterns to filter (see page 19)

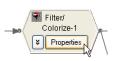
4 Using the Filter/Colorize Tool

To insert or delete filter clauses

A Filter/Colorize tool can have multiple filter clauses, for example, to use different colors for different samples, to hide or show different samples, or to alternate between different filters. (You can also alternate between different filters by storing (see page 32) and recalling Filter/Colorize tool setups (see page 33) or by enabling/disabling multiple Filter/Colorize tools (see page 35).)

To insert or delete filter clauses:

1 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, click the ^E button associated with a filter clause, and choose Insert Filter Clause After, Insert Filter Clause Before, or Delete Filter Clause.



Combining Filter When you enable several Color filters, the first filter takes precedence. **Clauses**

Example This pair of filters:



gives this result:



When you enable several Show filters, each filter successively filters the output of the preceding filters.

Example This pair of filters:

Show when Show when Bus/Signal My Bus 1 All bits In Range O2 to O3 Hex S
Show when V Bus/Signal My Bus 1 All bits In Range 03 In Range 03

gives this result:



The first filter hides all states except 02 and 03. The second filter hides the 02 states.

To show several ranges in your data, OR them within a single filter as shown in the next example.

Example The pair of filters in the previous example can be entered as two OR'd events in one filter:

Show v when Bus/Signal v My Bus 1 Insert Event <u>A</u> fter (AND/OR)	All bits 💌 In Range	✓ 02 ■ to 03 ■ Hex ¥	
Insert Event Before (AND/OR) Delete Event			
Show when Bus/Signal My Bus 1 Bus/Signal My Bus 1	All bits 💙 In Range	✓ 02 ■ to 03 ■ Hex * 0 ✓ 03 ■ to 04 ■ Hex *	Dr 🔽

which gives this result:

4 Using the Filter/Colorize Tool



To name filter clauses

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:

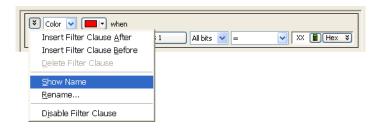


2 In the Filter/Colorize dialog, click the button associated with a filter clause, and choose **Rename...**.



3 In the Rename Filter dialog, enter the desired filter clause name, and click **OK**.

To show/hide filter clause names 1 In the Filter/Colorize dialog, click the ^I button associated with a filter clause, and choose **Show Name** or **Hide Name**.



Filter clause names look like:

Ny Filter				
Color 🔽 💻 🗸 when				
🗧 😽 Bus/Signal 👻	My Bus 1	All bits 🔽 =	🖌 🔀	Hex 💙

4 Using the Filter/Colorize Tool

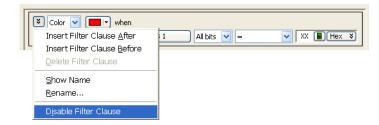
To disable or enable filter clauses

A Filter/Colorize tool can contain multiple filter clauses. You can disable or enable filter clauses to control which filters are applied to your data.

1 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, click the [▼] button associated with a filter clause, and choose **Disable Filter Clause** or **Enable Filter Clause**.



A disabled filter clause looks like:



To change the "across all data" option

When there are multiple data sources flowing into the Filter/Colorize tool, the **Filter/Colorize across all data** option specifies how the operation is applied across data sources.

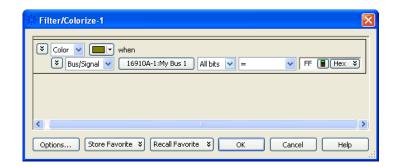
Modules	Tools	Windows
Slot D My 16910A-1	Filter/ Colorize-1 > Properties	Listing-1 Show
Slot E My 16950A-1	/	Waveform-1 Show

To change the "across all data" option:

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, click Options....



3 In the Filter Options dialog, either check or uncheck the Filter/Colorize across all data option and click OK.

4 Using the Filter/Colorize Tool



When checked, the Filter/Colorize operation spans all data sources:

Scale 2 ns/div	<u>→T±) t⊤t</u> Del	ay 4 ns			┍╷╧┖╷┝┥	J		
		<mark>€MI</mark>	Ţ					<u>M2</u> →
Bus/Signal	Simple Trigger	-2 ns	0 s	2 ns	4 ns	6 ns	8 ns	10 ns
							1 1 1	
	= 🗧 FF 🔳	FE	<u>_</u>	FF			00	(01
	= * × 🔳	X 55		AA	X	5D	55	X
Time		-2.874 ns		П				10.459 ns

When unchecked, the operation only affects the data sources specified in the Filter/Colorize patterns:

Scale 2 ns/div		ay 4 ns	∎⊯∎⊥T⊥		
		<mark>€MI</mark> Į			M2->
Bus/Signal	Simple Trigger	-2 ns 0 s	s 2ns 4ns	6ns 8ns 10n	s 1 1
⊞‡ My 16910A-1:My Bus 1	= 🗧 FF 🔳	FE	FF	(01 🔷
⊞‡ My 16950A-1:My Bus 1	= * × •	X 55	Хаа	5D 55	X
Time		-2.874 ns I I I	1 11 11	10.4 	59 ns I

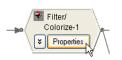
When using multiple buses/signals in an "OR" condition, each bus/signal should be specified as part of its own filter clause. This causes a logical "OR" of filter events and provides for independent filtering between the input data sources. Otherwise, filtering will be applied across all buses/signals in the same filter clause, regardless of which part of the clause satisfies the filter condition.

For example, if you are filtering out whenever the bus 8bbyte0 is FF from either the Analyzer W or Analyzer Y, you should specify the two conditions in separate clauses like so:

😤 Filter/Colorize-1
Ide when Bus/Signal Analyzer W:8bbyte0 All bits
Ide when Bus/Signal Analyzer Y:8bbyte0 All bits
<>
Options Store Favorite V Recall Favorite V OK Cancel Help

To store favorite Filter/Colorize tool setups

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, click Store Favorite.

	Store Favorite 🛛 Recall Fav	/orite ¥
-	New	
	To File	
	Delete	
	#1 - My Favorite C	
	#2 - My Favorite B	
	#3 - My Favorite A	

• To store as a new favorite, choose New

💥 Fav	orite	
Name	My Favorite #4	OK Cancel

In the Favorite dialog, enter a name, and click OK.

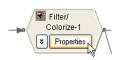
- To store as an XML format file, choose **To File...**. In the Save As dialog, enter a file name, and click **Save**.
- To store over an existing favorite, choose that favorite from the bottom of the menu.

NOTE

When a Filter/Colorize tool is deleted from the Overview window, any favorites that were created are also deleted.

To recall favorite Filter/Colorize tool setups

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, click **Recall Favorite** and select the favorite from the bottom of the menu.

Store Favorite 🛛	Recall Favorite 💙 OK	
	From File	
	#1 - My Favorite C	
	#2 - My Favorite B	
	#3 - My Favorite A	
	Last	
	Delete	

To recall a favorite from an XML format file, choose **From File...**. In the Open dialog, enter the file name, and click **Open**.

To delete favorite Filter/Colorize tool setups

 Open the Filter/Colorize tool's properties dialog by choosing Tools>(Filter/Colorize tool)>Properties or by clicking the tool's Properties button in the Overview window:



2 In the Filter/Colorize dialog, click Store Favorite or Recall Favorite and choose Delete....

1	Store Favorite 🛛 Recall Fav	orite 🛛
-	New	
	To File	
	Delete	
	#1 - My Favorite C	
	#2 - My Favorite B	
	#3 - My Favorite A	

Store Favorite 🛛	Recall Favorite 💙 OK
	#1 - My Favorite C #2 - My Favorite B #3 - My Favorite A
	Last
	Delete

3 In the Delete Favorites dialog, select the favorites you want to delete; then, click **Delete**.

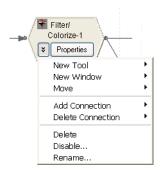
My Favorite C My Favorite B My Favorite A	Delete Cancel
-------------------------------------------------	------------------

To disable or enable a Filter/Colorize tool

You can use multiple Filter/Colorize tools and disable or enable them to control which filters are applied to your data.

1 From the *Agilent Logic Analyzer* application's main menu, choose Tools>(Filter/Colorize tool)>Disable or Tools>(Filter/Colorize tool)>Enable.

Or, in the Overview window, click the Filter/Colorize tool's s button, and choose **Disable** or **Enable**.

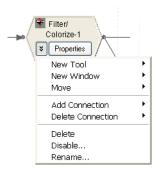


4 Using the Filter/Colorize Tool

To rename a Filter/Colorize tool

1 From the *Agilent Logic Analyzer* application's main menu, choose Tools>(Filter/Colorize tool)>Rename....

Or, in the Overview window, click the Filter/Colorize tool's $\ensuremath{\mathbbmu}$ button, and choose $\ensuremath{\mathbf{Rename...}}$

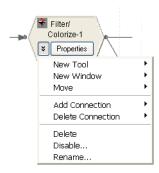


2 In the Rename dialog, enter the desired Filter/Colorize tool name and click **OK**.

To delete a Filter/Colorize tool

1 From the *Agilent Logic Analyzer* application's main menu, choose Tools>(Filter/Colorize tool)>Delete.

Or, in the Overview window, click the Filter/Colorize tool's $\ensuremath{\mathbbmsss{s}}$ button, and choose $\ensuremath{\textbf{Delete}}.$



The Filter/Colorize Tool vs. Filtering in the Trigger

	Both the Filter/Colorize tool and triggers can be used to select which captured samples are displayed. In general, it is best to use the most specific trigger possible; then, use the Filter/Colorize tool to hide, highlight, or explore the captured data.
Advantages of Filtering in the Trigger	• If you use "storage qualification" (in the online help), only the samples you care about are stored. Thus, you can capture data over a longer period of time.
	• Triggers can use if/then logic to analyze the relationship between samples in time.
Advantages of the Filter/Colorize Tool	• The Filter/Colorize tool can be used when storage qualification cannot (when the logic analyzer is in "Full Channel Timing Mode" (in the online help) or "Half Channel Timing Mode" (in the online help)).
	• The Filter/Colorize tool can be modified without re-running a measurement. This is useful when you are not sure exactly what you are looking for in the data, or when you are capturing a difficult-to-reproduce event.
	• Filter/Colorize tools can be cascaded.
	• Filter/Colorize tools can be temporarily disabled so you can see which samples are being filtered out.
See Also	• "Capturing Data from the Device Under Test" (in the online help)



The Packet Decoder tool is used in conjunction with the bus analysis tools and probes. Loading the configuration file for a probe will automatically set up a Packet Decoder tool. It is also possible to set up a new Packet Decoder tool using the **Tools>New Packet Decoder...** menu item.

Packet Viewer windows are typically used to view information from the Packet Decoder tool (see "Analyzing Packet Data" (in the online help)).

The Packet Decoder tool has these tabs:

Packet Decode Properties	
Protocol Select ASCII Decode Options	
Protocol Selection	
Protocol Family: PCI Express	~

- **Protocol Select** lets you select the protocol to use, along with other information that may affect how the data is decoded (such as the number of lanes or the direction of traffic).
- **ASCII Decode Options** lets you enable ASCII decode output (if you want to view decode information in Listing windows) and specify related decoding options.
- **See Also** If the analysis probe add-in software is installed, refer to the online help for more information on using the Packet Decoder tool:

"DigRF Acquisition Probe" (in the online help)

"FlexRay Packet Decode" (in the online help)

"InfiniBand Analysis Probe" (in the online help)

"PCI Express Analysis Probe" (in the online help)

"Serial ATA/SAS Analysis Probe"



5 Using the Packet Decoder Tool



The Agilent Logic Analyzer install CD has an *Analysis AddIn Wizard* that helps you develop your own inverse assemblers or analysis tools.

The Analysis AddIn Wizard works with Microsoft Visual Studio .NET.

To install the Analysis AddIn Wizard:

- 1 Browse the Agilent Logic Analyzer install CD.
- **2** Run *SetupAnalysisIAWizard.exe* and follow the instructions to install the proper files.

The files will be installed into the C:\Program Files\Agilent Technologies\Logic Development\Analysis AddIn Wizard directory.

3 Refer to the documentation in the *docs* subdirectory for more information on using the Analysis API.



6 To develop your own tools

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