



BitHound
An FPGA-based Logic Analyzer

Manual

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Intended for BitHound Atlys V2.1

Network Prerequisites

As Ethernet is used to connect the Logic Analyzer with the PC that runs the client software, several aspects have to be kept in mind.

There are two ways that the BitHound can connect to the PC:

1.) A DHCP-Server is present in the Network.

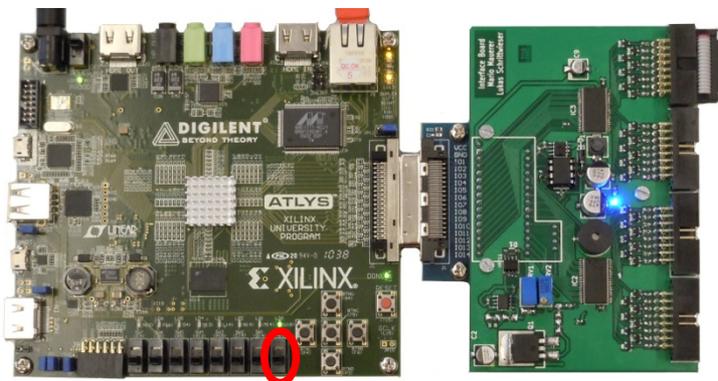
If this is the case, the BitHound and the client can be connected anywhere in the network, as long as there is no router between. Switches are OK.

2.) The BitHound and the client-PC are connected directly.

Now, the client-PC has to assign a fixed IP in the following scheme: 10.0.0.x (e.g. 10.0.0.1). However, (only) 10.0.0.2 does NOT work!

Per default BitHound will try to obtain an IP Adresse from an DHCP Server in your network. If that fails it defaults to 10.0.0.2. Once an IP address has been configured it is displayed in the LCD.

If you do not use a DHCP Server (eg if you connect BitHound to you PC directly) you can speed up things using the switch next to LD0 (see picture below). If the switch is moved towards the center of the ATLYS board BitHound will not try to receive an address from a DHCP and immediately use 10.0.0.2.



Client Software

The client software is provided for Windows and Linux and requires Java.

Start the client by executing analyzer.jar.

If the BitHound could be found in the network, there will be no error. Otherwise, a window will pop up and the client will terminate. Make sure that the BitHound can be found in the network by the client software. (It can last some 10 seconds until the BitHound is found in the network.)

If you have an LCD attached to the BitHound, it will show the IP-Address as soon as it is connected. From now on, the client should run.

First, we want to set up a trigger. Click on the „red rocket“ icon in the toolbar.

Analyzer Port: Do nothing

Sampling Clock: Internal.

Sampling Rate: As desired.

Channel Groups: As desired.

Recording Size: As desired.

Noise Filter: As desired (suppresses short spikes)

Trigger Settings:

Mode: Free running or enabled

Before/After Ratio: As desired, move the trigger point in the sampled data.

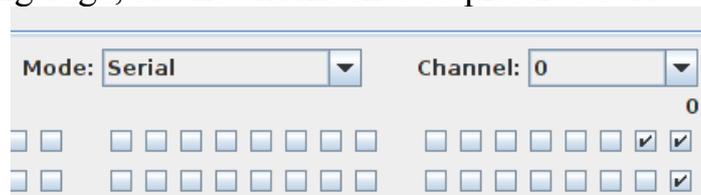
Type: Simple or Advanced. When simple, it can only be triggered on rising/falling edge of a specified channel.

Advanced Trigger:

The advanced trigger consists of 8 trigger stages. Each stage can work in serial or parallel mode. Select the desired number of stages and configure them individually:

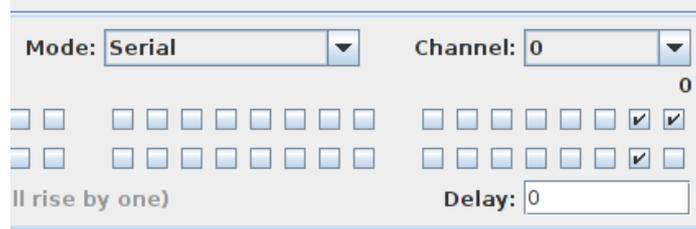
Serial: This mode triggers on a rising or falling edge of a selected channel. Select the desired channel with the dropdown menu.

To trigger on a rising edge, set the checkboxes as pictured below.

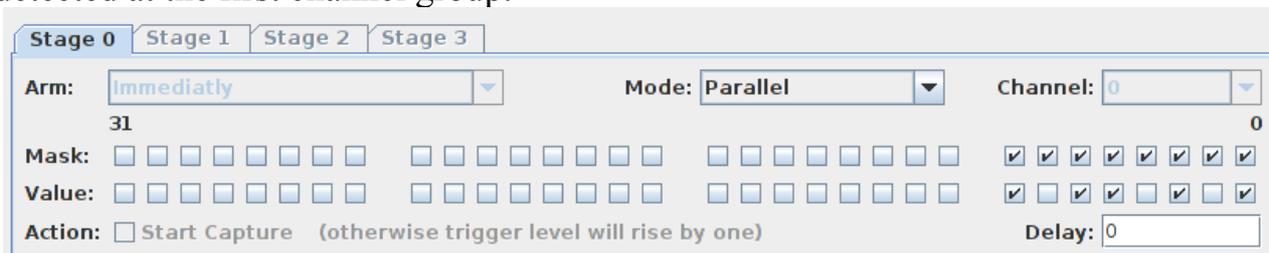


The data is sampled on one channel and shifted from right to left „through“ the checkboxes.

To trigger on a falling edge, set the checkboxes as pictured below.



Parallel: This mode triggers, when a specific bit-combination is detected at the inputs. Mask the desired bits and their desired values using the checkboxes. In the following picture, the trigger fires, as soon as the byte „0b10110101“ is detected at the first channel group.



As soon as you have configured your stages, you have to interconnect them using the **Stage-Interconnection-Matrix**.

You can build a logical combination of the stages. This combination will be displayed on the right with a string. The trigger only starts capturing the data, if this logical condition is fulfilled. E.g. Stage1 AND Stage2 have fired at the same sample.

Cascading the trigger stages is also possible. Use the „create next armed stages“-checkboxes to cascade the stages. As soon as one stage has fired, it arms the next stage. Before a stage isn't armed, it won't fire. When no cascading is selected, every stage is armed. The trigger-cascade will be highlighted with a colored background. Now, Click on „**Capture**“. The client now waits until the BitHound triggers. As soon as this has happened, the data will be transferred to the client PC where it will be displayed.

In the **toolbar**, there are a few tools to help you analyze the waveforms.



Button 1 can set a marker.

Button 2 will delete a marker, when the cursor is positioned exactly on the marker and this button is pressed.

When holding the left mousebutton down and drawing the cursor over the screen, the „lapsed“ time and frequency are displayed at the bottom of the screen.

Button 3 and 4 will run to the next marker.

Button 5 and 6 will run to the next edge.