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Using the Beagle USB Protocol Analyzer to Capture High-Speed USB Data

While the Beagle™ USB Protocol Analyzer is only able to capture full-speed and low-speed USB data, it can still be a useful tool for engineers who develop high-speed USB devices. This can be done by taking advantage of a full-speed USB hub. These hubs can regulate high-speed USB traffic to the full-speed 12 Mbits/s rate at which the Beagle analyzer can capture.

How can a full-speed analyzer help to debug a high-speed device?

There are several situations where a full-speed USB analyzer is more than sufficient to help debug a high-speed device. Usually developers are working with certified silicon or IP cores in which basic USB packet transactions work as expected. In these situations, most problems that arise are usually at the higher protocol layers.

There are some differences in the higher protocol layers between full-speed USB and high-speed USB, but in most cases these aren't significant. Another important consideration is that according to the USB specification, high-speed USB devices should be interoperable with on the full-speed USB bus. This interoperability includes enumeration which the Beagle USB analyzer can easily capture.

Many developers using Total Phase's tools have been able to successfully capture and debug high-speed USB devices using the method described in this article. For example, one developer was working on porting an existing high-speed USB device to the Macintosh. After several days of frustration, the developer obtained a Beagle USB analyzer and used it in conjunction with a full-speed USB hub to capture the data. The developer immediately detected the problem and was able get the device working in less than an hour.

How to capture high-speed traffic

Setting up the Beagle USB Protocol Analyzer to capture high-speed data is very straightforward. The basic topology is described below:

Target Host -- Full-Speed Hub -- Beagle USB Analyzer -- Target Device

It is important to have the full-speed hub connected in between the target host and the Beagle USB analyzer captures only the target device's communications. The following picture provides an example of how to set up the Beagle USB analyzer to capture a high-speed USB target device.

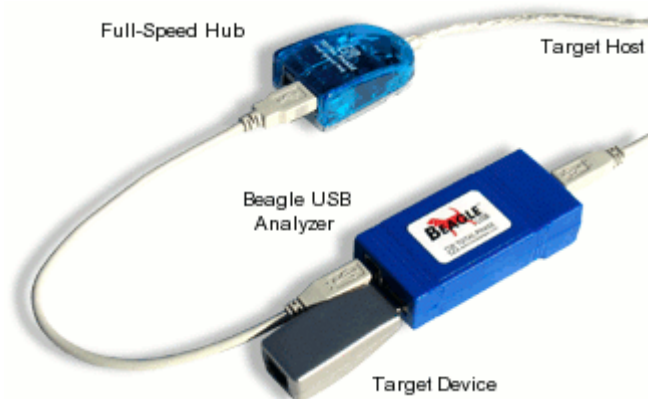


Figure 1: Sample Configuration. The Full-Speed USB Hub is used to drop the bitrate of all downstream USB devices. In this configuration, the USB hub is connected to the target host port of the Beagle USB Protocol Analyzer.

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Beagle USB ご購入ありがとうございます。

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これを併用することで、High Speed USB のプロトコルをFull Speedに変換された形で、Beagle USB で解析することができます。もちろん、速度その他の点で、完全に、High Speed 解析ができるわけではありませんが、既存のHigh Speed USBデバイス（ハードウェア動作はICメーカーが確認済み）のソフトウェアデバッグなどには、実はこれで十分な場合も多いかと思えます。

市場ではもはやFull Speed ハブは、なかなか入手できないとのことでしたので、在庫することにいたしました。

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