*Technical Article*

# *How I Learned to Stop Worrying and Love USB Type-C*

Gregory Waterfall

***[Scene** : Greg Waterfall and Jim Bird are enjoying a burger and beverage at their favorite watering hole.]*

**Greg:**

OK Jim, I now see the value of USB Type-C, especially with power delivery, but what else can it do for me? Today's USB ports have great data speeds and they're ubiquitous. Do you know what that word means?

**Jim:**

Indeed, I know the meaning; trust me when I say you have only begun to learn the powerful ways of Type-C. I intend to cause you no discomfort, but it's time we discussed alternate modes. The power of these diverse alternate capabilities is understood by very few. But those with enlightenment have found worlds of opportunity not previously available. The alternate energy surrounds us and binds us –

**Greg:**

"Alternate modes"? What's that? And do you always have to start quoting your favorite movies?! Maybe its time for you to switch to water, because that barley pop is going to your head! "Alternate modes" … I bike to work but I don't see what that has to do with USB unless you are talking about the university system buses. I don't like to ride them. They have a fairly identifiable odor and it is not new bus smell.

**Jim:**

No need to ride the bus, as far as I know. Alternate modes are a feature of USB Type-C that allow existing signals using non-USB protocols to be sent across the USB Type-C cable in its native format. There's no need to convert to USB just to get down the cable. Close your eyes and imagine high-definition mulitimedia interface (HDMI) signals going down the Type-C cable in HDMI format. There's no need to translate to USB and then back to HDMI at the device end. Now open your eyes and take that fresh beverage the waitress is handing you.

**Greg:**

Interesting, but can't I do that with existing USB? I have a USB-to-Ethernet adapter. Doesn't that just do the same thing?

**Jim:**

Actually no. Your computer sends the data to a USB modem in its USB port. At the big end of the adapter is another USB modem that converts it to a data format that is passed to an Ethernet modem in the adapter. Then the data is sent down the Ethernet cable.

**Greg:**

OK. So what? That works just fine for me.

**Jim:**

But why use three modems when one will do? With Type-C you can connect an Ethernet modem in the notebook to the wires in the USB cable. The adapter just needs to connect those wires correctly to your Ethernet cable. The old USB way is like digging holes and filling them in again. USB Type-C is elegant.

**Greg:**

So I might get a faster Ethernet connection and a cheaper adapter. Is there more?

**Jim:**

Yes – along with that you get free standard alternative modes, mobile high-definition link (MHL) and DisplayPort, which are video/audio communication standards that enable you to do things like play video from your phone or tablet directly onto a television. All you need is a USB Type-C cable. Reducing the number of conversions saves time, energy and signal fidelity.

**Greg:**

What else will it do!?

**Jim:**

How about enabling you to use an audio adapter mode to send “analog” audio across the cable? You’ll be able to break out your old vintage headphones and listen to Bing Crosby from your favorite device.

**Greg:**

Awesome. Now I really want USB Type-C!

**Jim:**

You aren’t the only one. Everyone I talk to wants to learn more, so I send them to check out TI’s USB Type-C products and solutions.

**Additional Resources**

If you too would like to hear more about Type-C, stop by TI’s booth at CES, located in the North Hall #N115-N118. If you can’t attend the show:

- Learn about the TPS25810, which enables USB Type-C ports with the configuration channel logic needed for Type-C ecosystems.
- Read about how USB Type-C will make life easier.

# IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265