Analog Devices' Digital Isolation Update
*i*Coupler® News

Welcome to another edition of the Analog Devices' Digital Isolation Update. Whether you are already using *i*Coupler technology or still designing with optocouplers, this Digital Isolation Update will keep you posted as we continue to introduce a wide array of new isolation products, including gate drivers, transceivers, and multi-channel digital isolators with *iso*Power® isolated, integrated DC/DC converters.

Each Digital Isolation Update includes a look at New Products, a special application note we call "N***App***kin **Notes**," and a feature filled with insights and interesting facts that we call Inside *i*Coupler Technology.

We are always looking for feedback, so please feel free to e-mail us at: *i*Coupler_Isolation@analog.com.

New *i*Coupler Products

ADuM4160 – Industry's First Single-IC USB Isolator

The ADuM4160 is the industry's first single-IC USB isolator that meets the most demanding medical and industrial standards while replacing complex board level solutions. The ADuM4160 offers 5kV rms medical-grade isolation as well as upstream short-circuit protection, and fully isolated 1.5-Mbps and 12-Mbps data rates. (IEC 60601-1 medical safety approvals are pending.) Learn more about the ADuM4160 here.

ADuM4400 / ADuM4401 / ADuM4402 – 5-kV rms Quad-Channel Digital Isolators

The ADuM440x are quad-channel digital isolators with 5-kV rms medical-grade isolation (IEC 60601-1 approvals pending). The ADuM440x contain circuit and layout enhancements to help achieve system-level IEC 61000-4-x compliance (ESD/burst/surge). Offered in a variety of channel configurations and data rates, the ADuM440x isolators have a patented refresh feature that ensures dc correctness in the absence of input logic transitions and during power-up/power-down conditions. Learn more about the ADuM440x family here.

ADuM6400 / ADuM6401 / ADuM6402 / ADuM6403 / ADuM6404 – Single-Package Solution for Medical-Grade Data and Power Isolation

The ADuM640x quad-channel digital isolator family offer 5-kV rms medical-grade isolation (IEC 60601-1 approvals pending) in a variety of channel configurations and data rates. The ADuM640x includes an *iso*Power dc-to-dc converter, providing up to 500 mW of isolated power and isolated signal channels within a single package. The ADuM640x also includes a thermal shutdown feature to ensure safe operation. Learn more about the ADuM640x family here.

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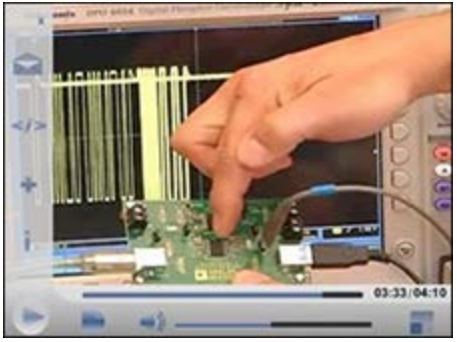
General News

SPECIAL INTRODUCTORY VIDEO – ADuM4160

By Mark Cantrell, Applications Engineer

See the introductory video on the ADuM4160, our integrated, single chip, *i*Coupler-based USB

isolator that combines the ease of use of an off-the-shelf isolated USB module with the integration capability of a stand alone Serial Interface Engine.



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*N**App**kin **Notes** – written expressly for the* Digital Isolation Update *– are ideas, hints, and tips for building with iCoupler technology.*

N***App***kin **Note: Building an Isolated USB Cable**
By: Mark Cantrell, Applications Engineer

Building an isolated USB cable requires both isolated D+ and D- lines as well as an isolated dc-dc converter to supply power to the downstream port and cable. As can be seen in the example schematic in Figure 1, the combination of the ADuM4160 isolator and ADuM5000 *iso*Power device provide an extremely simple and effective solution for specific applications. This circuit will operate at Full speed, 12Mbps, and provide isolated +5V to the downstream USB cable. The only additional circuit elements are bypass capacitors for the various power input and output pins as well as external series resistors for the D+ and D- lines. The ADuM4160 was developed primarily as a device to isolate peripherals; however it can also meet the electrical requirements of USB 2.0 as an embedded host, thereby making it possible to design an isolated USB cable. There are some considerations in using the ADuM4160 in an isolated USB cable, and these are reviewed in this note. These considerations relate to isolated power, speed mode configuration, and propagation delay.

Read the entire NapNote in this PDF.

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Inside *i*Coupler Technology

By Eric Gaalaas, Design Engineer

Analog Devices' new USB isolator chip, the ADuM4160, enables bi-directional, isolated USB 2.0 compliant communication between the two sides of its package at both low speed (1.5 Mbps) and full speed (12 Mbps) data rates. The ADuM4160 replaces multiple components that, until now, have been required to isolate USB. This article describes how the ADuM4160 design achieves this.

Read the entire *i*Coupler article in this PDF.

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