How Optical Isolation Works (with Dual Power Supplies) - Illustration

One "Channel" of data in
Data Input

Optical Isolator

1. Light Emitting Diode
2. Optically Transparent Insulating Barrier
3. Phototransistor Circuitry

Two isolated power sources are required to maintain isolation of power, ground and optically isolated signals.

Power Supply option with some RS232 models.
How Optical Isolation Works (USB) - Illustration

How Optical Isolation Works

Electrical Signal is Converted to LIGHT (IR)
LIGHT Turning On/Off is Converted to Electrical Signal

+5V
+5V
+5V
+5V

USB to UART IC
TXD
RXD
TXD EN
REG PS
SW SUP
USB Power Bus in

ISO-GND
ISO-GND
ISO-GND
ISO-GND

TD+ Data
TD- Output
RD+
RD-

Mode SW

USOPTL4
USOPTL4DR

Transformer Isolated Switching Power Supply

Data Signals Optically Isolated Power Supply and Grounds are Transformer Isolated

USOPTL4DR-2 (1/2)
USOPTL4-2 (1/2)
USOPTL4-4 (1/4)

Optical Isolator IC Contains:
1. Light Emitting Diode (IR)
2. Optically Transparent Barrier
3. Photo Diode
4. Darlington Pair of Transistors

Each port duplicates isolated side