High Speed Ruggedized Fiber-to-USB Interface Converter

The Model 4165/4166 is a high speed ruggedized Fiber-to-USB interface converter from Electro Standards Laboratories. With its integrated rate buffering, the Model 4165/4166 converts USB 2.0 compliant data from a standard PC to a serial asynchronous data interface over fiber with a user selectable baud rate of up to 3 Mbps. The Model 4165/4166 is ideal for applications involving PC communications that require high speed, secure communications, and optical isolation. Typical applications include constructing an optically isolated point-to-point communications link between the USB ports of two PC's, or an optically isolated high speed communication link between a PC and a serial data network subjected to a high EMI environment that might corrupt communications over a copper interface. Designed to operate from -40°C to +85°C, it is a member of

Desktop Unit

Model 4165
(Cat No. 304165)

Electro Standards Laboratories rugged community media converter family. The unit features ESD protection circuitry on the USB I/O connector. The unit's power input is protected from transients and features 3kVDC isolation to prevent system ground loops. It can be powered from a wide input range of 10VDC-36VDC, with models also available for other voltage ranges such as 4.5VDC-9VDC and 19VDC-72VDC. Other features include user selectable fiber polarity, user selectable asynchronous data format, dual DB9 power connectors (board only) for convenience in bused power applications, Tx, Rx, and Power indicator LEDs. The converter is available as a board only with front mounting threaded brackets for rack mounting in embedded applications. It is also available in a desk top package with DIN rail mounting hardware for applications that require an enclosure.

Specifications:

Fiber Interface:
Connectors: Fiber Optic ST
TX Power: -12.5 dBm
RX Sensitivity: -27.5 dBm
Optical Budget: 15 dB
Max. Link Distance with 62.5/125 μm fiber:
    5.35 kM up to 3 Mbps, 25°C
    3.75 kM up to 3 Mbps, -40°C to +85°C
Wavelength: 820 nm/850 nm, multimode
Fiber Size: 50/125 μm, 62.5/125 μm, 100/140 μm

Fiber Polarity:
Logical 1 = Light ON/OFF: User Selectable

Fiber Data Format:
Type: Asynchronous, user selectable format
Rate: User selectable baud rates from 300 bps to 3 Mbps
Fiber-to-USB rate conversion: Internally buffered.

USB Interface:
Connectors: USB, Type B, High Retention

USB Data Format:
Type: USB 2.0 Compliant USB Client
Rate: Supports low speed (1.5 Mbps),
    Full speed (12 Mbps), and high speed
    (480 Mbps) USB Data transfer rates.

Indicators:
LEDs:TXD, RXD, PWR

Power:
Input Power: 10VDC-36VDC std, 4.5VDC-9VDC,
    19VDC-72VDC, Others at 1.5W.
Isolation: 3 kVDC
Connectors: Dual DB9F for Power Daisy Chaining
    (board only),
    DC Power Jack (desktop unit)

Operating Environment:
-40°C to +85°C

Model 4166 Mechanical (Board Only):
Model / Cat No: 4166 / 304166
Size: 4.8" x 3.9" x 0.63"
Weight: Approx. 3.2 oz (91g)
Mounting: Mounting Holes, Rt Angle Brackets

Model 4165 Mechanical (Desktop Unit):
Model / Cat No: 4165 / 304165
Size: 5" x 4.25" x 1.4"
Weight: Approx. 9.8 oz (278g)
Mounting: 4 Threaded Holes Std, DIN rail

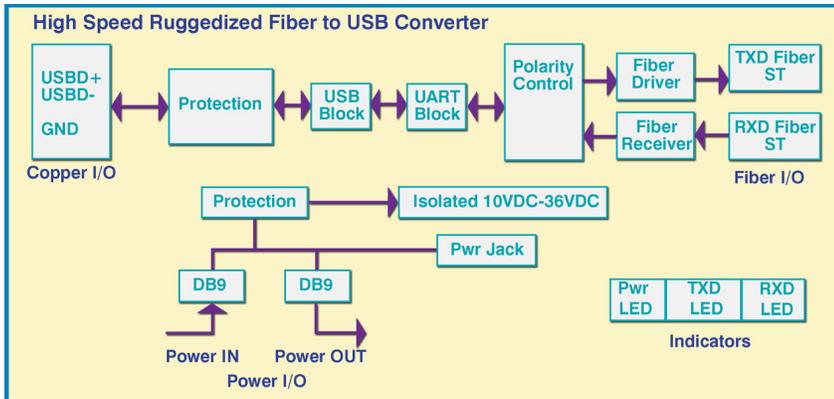# High Speed Ruggedized Fiber-to-USB Interface Converter

High Speed Ruggedized Fiber to USB Converter

Block diagram showing: USBD+ USBD- GND (Copper I/O) → Protection → USB Block → UART Block → Polarity Control → Fiber Driver → TXD Fiber ST / Fiber Receiver → RXD Fiber ST (Fiber I/O). Protection → Isolated 10VDC-36VDC → Pwr Jack. DB9 / DB9 → Power IN / Power OUT (Power I/O). Indicators: Pwr LED, TXD LED, RXD LED.

Board Unit

Model 4166
(Cat No. 304166)

Model 4165/4166 Application:

PC ↔ USB ↔ Fiber-to-USB Model 4165/4166 (USB / FIBER) ↔ ST Fiber Link ↔ Fiber-to-USB Model 4165/4166 (FIBER / USB) ↔ USB ↔ PC
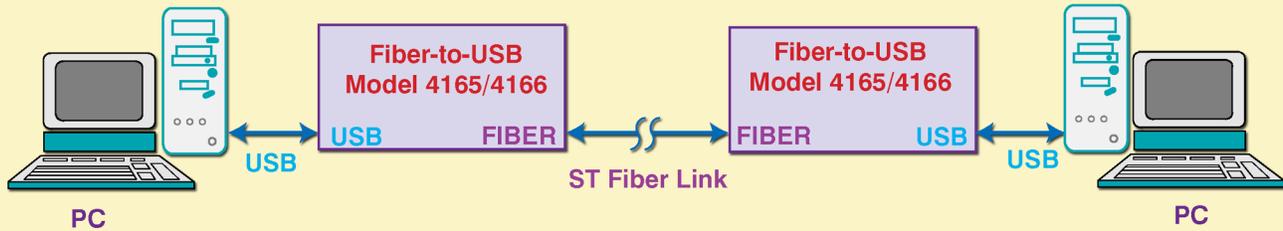
Point-to-Point Isolated PC USB Communications.

Model 4165/4166 Application:

PC ↔ USB ↔ Fiber-to-USB Model 4165/4166 (USB / FIBER) ↔ ST Fiber Link ↔ Fiber Serial Interface/Network up to 3 Mbps
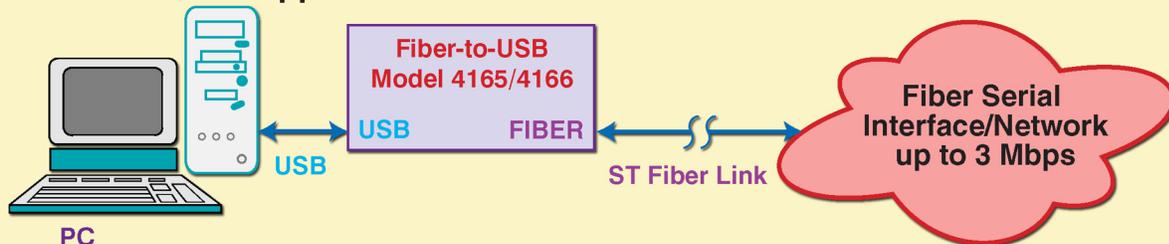
Isolated PC USB communications to fiber serial interface/network.

Model 4165/4166 to Model 4149/4159 Application:

PC ↔ USB ↔ Fiber-to-USB Model 4165/4166 (USB / FIBER) ↔ ST Fiber Link ↔ Fiber-to-RS232/RS485 Model 4149/4159 (FIBER RS232/RS485) ↔ Serial Interface/Network up to 3 Mbps
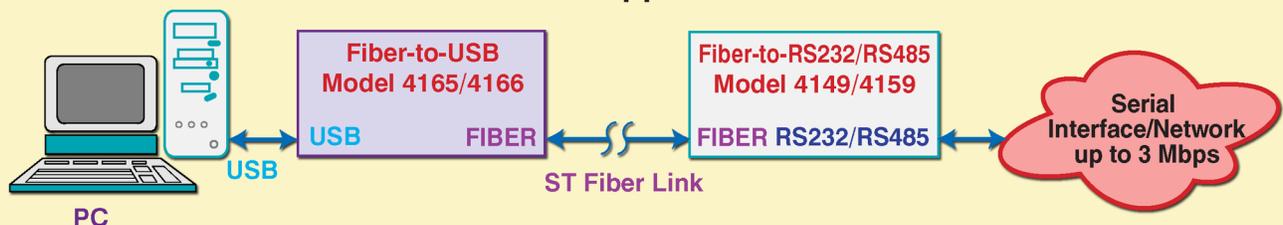
Isolated PC USB to RS232/RS485 communications serial interface/network.