

Manual

USB Isolator



Release
Model

1.0
33001

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USB interfaces in stationary computers unfortunately have the basic drawback of having no galvanic isolation for the signal lines.

In many applications in the consumer world this limitation is irrelevant, since the USB devices connected to the PC are generally supplied through the bus and do not have any reference to a second ground or to the ground conductor.

In the areas of measurement reading, process control or for example medical technology, galvanic isolation of the connected devices is mandatory in order to prevent ground loops on the USB line.

Wiesemann & Theis therefore offers an USB Isolator which is described on the following pages along with his technical specification and a wiring example.

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USB Isolator, 1kV, #33001**Function**

The Wiesemann & Theis USB-Isolator #33001 provides galvanic isolation for low-speed and full-speed USB connections with an isolation voltage of at least 1000V DC. The Isolator eliminates ground loops and prevents current from flowing between the connected devices and the supply lines of the USB caused by potential differences. The Isolator is simply inserted into the existing USB connection and powered by an external power supply.

Supply voltage

The USB Isolator requires an external power supply for powering the galvanically isolated Isolator side and a bus-powered terminal device.

A suitable wall mount adaptor is included with the Isolator. In principle any 5V DC power supply with a USB output can be used as long as it provides an output current of at least 0.5A.

The supply voltage is brought to the Isolator side through a mini-USB socket. The socket is marked on the Isolator as „Power Connector.“ An appropriate adapter cable for connecting the power supply is also included with the Isolator.

The USB A plug on the power cable must never be connected to a second USB port on the USB host or hub which is connected to the upstream port of the Isolator. Such a connection would jumper the galvanic isolation and make it ineffective. A galvanically isolated voltage source is therefore absolutely mandatory.

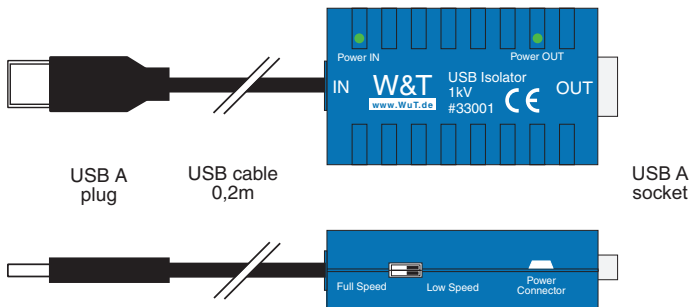


Display elements

The Isolator includes two green LEDs for indicating the correct supply voltage for the Isolator. The *Power IN* LED indicates correct power for the upstream side of the Isolator from the USB host or hub, whereas the *Power Out* LED indicates the voltage of the downstream side.

Speed switching

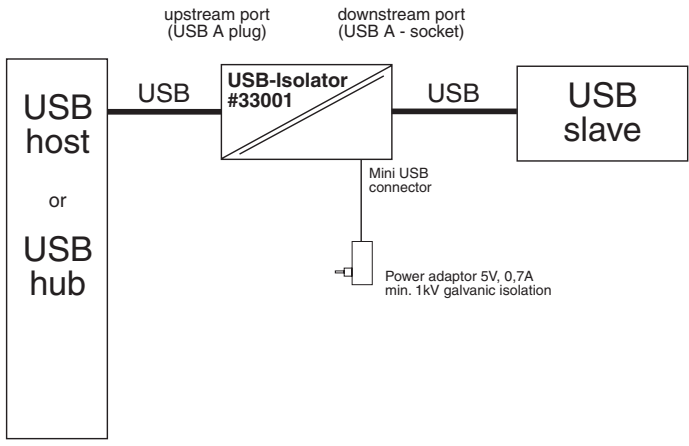
The USB-Isolator #33001 supports USB devices operating in low-speed mode at 1.5 MBit/s or full-speed mode at 12 MBit/s. Two small switches on the side of the Isolator labeled „Low Speed“ and „Full Speed“ are used to switch between the two speeds.



Each switch configures the upstream and downstream side of the Isolator. Since a speed conversion with the Isolator is not technically realizable, both switches must always be in the same position. The Isolator will not function with the switches in different positions.

The factory default setting for the Isolator is Full Speed mode.

Wiring example



Technical data

USB speed:	Configurable: Full Speed (12MBit/s), Low Speed (1.5 MBit/s)
Isolation voltage:	min. 1kV DC (high isolation voltages on request)
Power:	Upstream-Port: USB-supplied Downstream-Port: 5V DC using included power supply
Current draw:	Upstream-Port: max. 8 mA Downstream-Port: max. 8 mA plus current draw of the USB slave
USB connections:	Upstream-Port: USB A plug with 20 cm cable
Downstream-Port:	USB A socket integrated in housing
Ambient temperature:	Isolator: Storage: -40..+70°C, operating: 0..+70°C Power supply: Storage: -40..+70°C, operating: 0..+40°C
Permissible rel. humidity:	0..90% (non-condensing)
Housing:	Plastic compact housing, 55 x 30 x 16 mm
Weight:	approx. 35 g
Scope of delivery:	USB Isolator USB power supply 5V / 0.7A power cable, Mini-USB, 5-pin