THQtronic

USB Isolator

Technical explanation:

While it seems logical to isolate a USB connection when the device operates at high voltages, it should, so far, not discard the need to do the same for low voltages. Even working in low voltage, it is important to avoid ground loops.
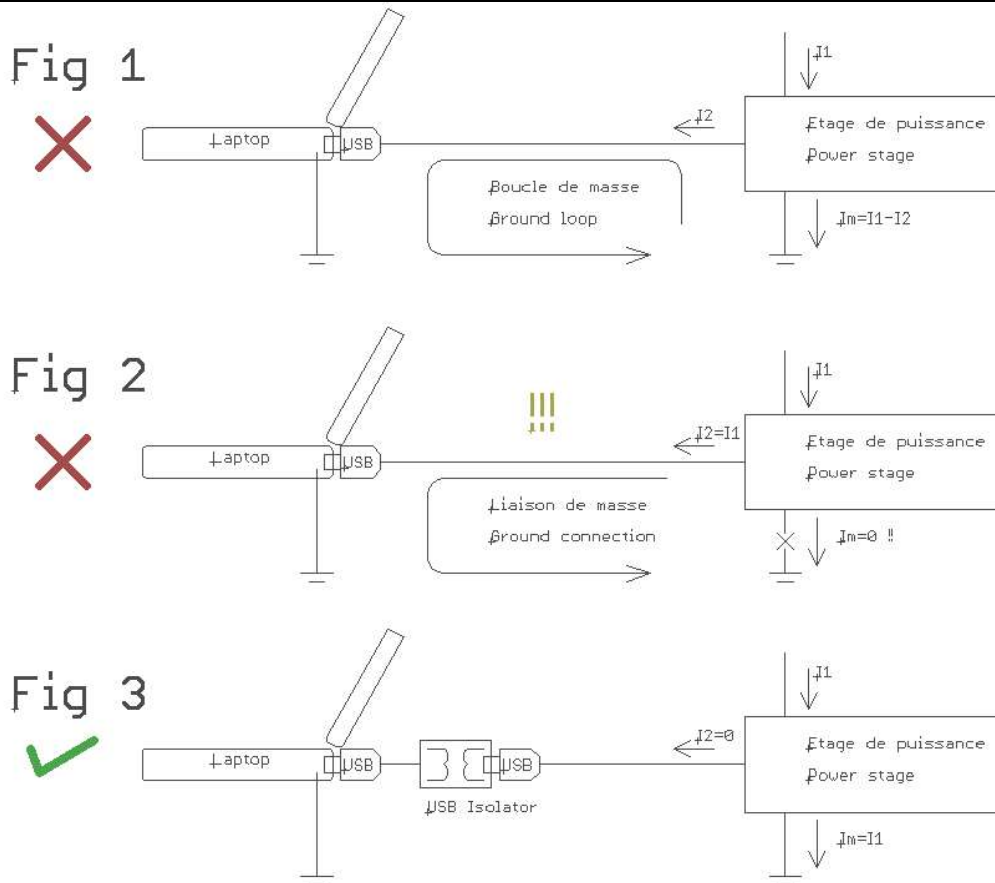The main reasons are as follows.
The first is that, as shown in Figure 1 below, if the device has its mass grounded, it is likely that the PC is also connected to the ground making a ground loop which makes it impossible current control. In parasitized environment by strong magnetic fields, induced currents arise in this loop and disrupt communication and device signal.
The second aspect is about security for computers. Indeed, in case of bad ground connection or worse, a rupture of the mass of the device power, the power current attempt to go through the PC. The motherboard is not at all designed to support the high power currents.
The USB-isolator keeps the USB communication while keeping separate grounds. Its internal isolated power supply also provides power for device(s) up to 350mA.

When it is important to separate grounds:

It is essential to isolate the masses when working on a table or bench test when the computer and electronic grounds are common. In this case, It is not good to connect grounds one more time by the communication line under penalty of generating a loop where the currents can not be controlled.

Fig 1

✗

Laptop USB

I1

I2

Etage de puissance
Power stage

Boucle de masse
Ground loop

Im=I1-I2

Fig 2

✗

Laptop USB

!!!

I1

I2=I1

Etage de puissance
Power stage

Liaison de masse
Ground connection

Im=0 !!

Fig 3

✓

Laptop USB — USB
USB Isolator

I1

I2=0

Etage de puissance
Power stage

Im=I1

How to use USB-Isolator

No driver is required. Connect the USB type A connector to the PC. The green LED indicates the presence of 5V device side.
Connect your device to the type A connector (female) USB-Isolator.
If you need to isolate multiple devices with the same mass, it is possible to connect a USB hub.
Check that you do not exceed the current available to power your devices.

Characteristics:

Max isolation voltage : 1000V DC
Max current supply by USB-Isolator: 350mA (5V)
Baudrate: 12Mb (Full Speed)
Compatibility: USB1.1. Work also on USB2.0 port if device is Full speed.
Dimensions: 40x27x16
Cable length (supplied): 0.5m (can be different follow availability)
Cable type : USB A / MicroUSB