



**USB ISO ADAPTER** Our Products: USB High Speed - High Isolated - Industry Converter Interfaces  
Highest quality - on the basis of our experience - we not accept compromise!

## USB 2.0 - RS485 High Isolated Industry Converter Box - product #247

**USB 2.0 <=> RS485 High Isolated Industry Converter Box (product no. #247)**

**Notes:**

Extreme EMC-safe 8KV !  
Extreme tough ! Designed for industry !  
9 switchable terminating resistors !  
Dimension outside boiler (mm) L 96 W 45 H 21 !  
Low current consumption ! High-Speed Digital Isolator (no optocoupler) !

**USB Modul:**

USB Specification 2.0 & 1.1  
Automatic switching Ready-Transmit  
Max. 3 Mbps "data transfer rate"  
Aided "Remote wake-up" and power management  
Plug & Play installing  
Royal driver - FTDI Chipset

**RS485 Receiver:**

+/- 15 kV Human Body Model  
+/- 6 kV IEC 1000-4-2, Contact Discharge  
+/- 12 kV IEC 1000-4-2, Air-Gap Discharge  
Allow Up to 128 Receivers on the Bus  
True-Fail-Safe Receiver  
-7V .. +12V Common-Mode Range  
Thermal Protection Against Output Short Circuit

**RS485 Driver:**

+/- 9 kV Human Body Model  
Slew-Rate Limited for Errorless Data Transmission  
-7V .. +12V Common-Mode Range  
Current Limiting  
Thermal Shutdown for Driver-Overload Protection

**Galvanic Isolation:**

High common-mode transient immunity: >25 kV/ $\mu$ s  
Safety and regulatory approvals  
UL recognition: 5000 V rms for 1 minute per UL 1577  
CSA Component Acceptance Notice #5A  
IEC 60950-1: 600 V rms (reinforced)  
IEC 60601-1: 250 V rms (reinforced)  
VDE certificate of conformity  
DIN V VDE V 0884-10 (VDE V 0884-10):2006-12  
VIORM = 846 V peak

EMC-safe: 8 KV

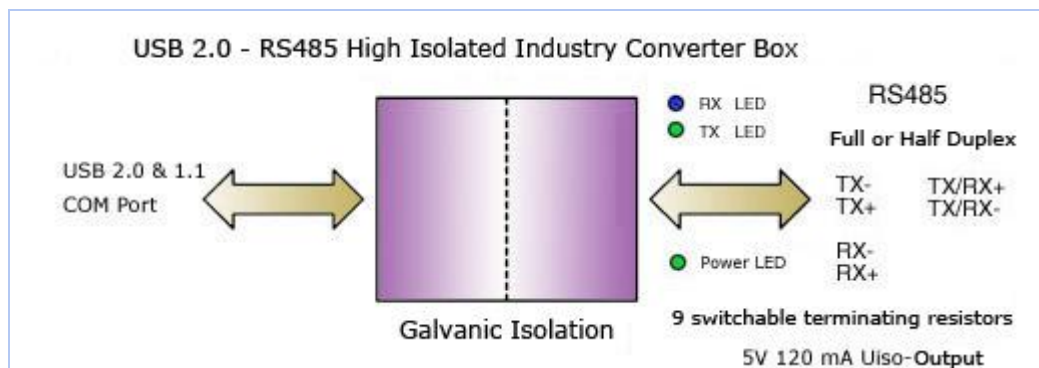
**Excellent References:**

Federal Armed Forces  
Base stations of Cellular mobile telephony  
Welding robots production line  
With Ferrite - Shield Bead - 99,99 % reliability contra system crash

**Extras:**

Galvanically isolated +5V DC 120mA Output - Pin 9

## Block diagram



## Converter images



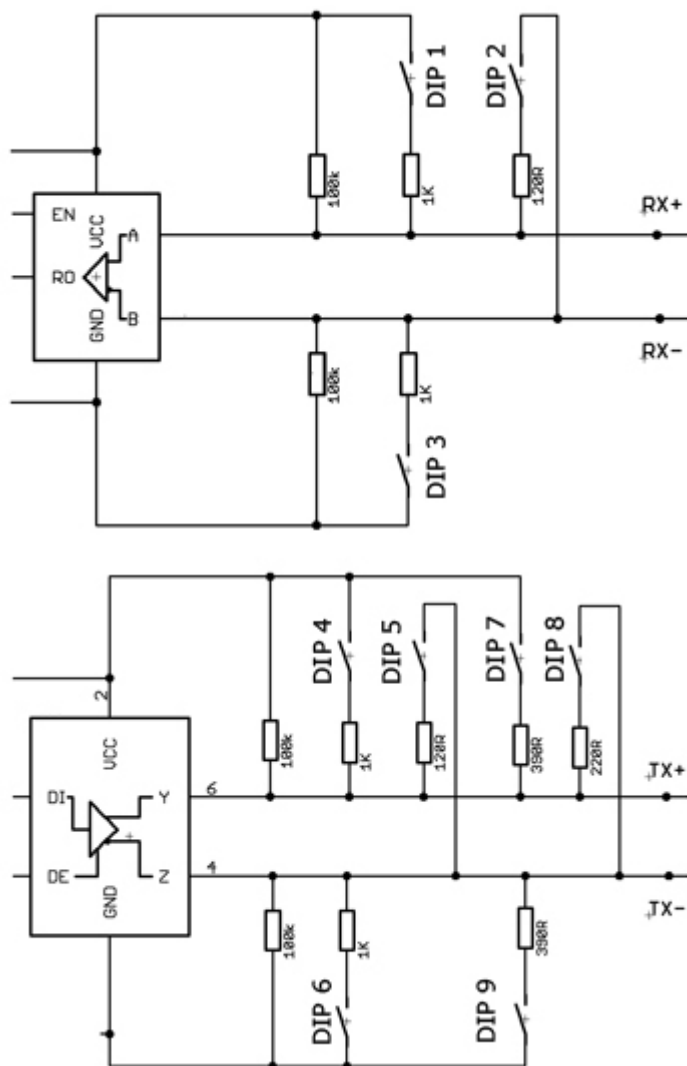
## Technical characteristics

Product:	USB 2.0 <=> RS485 High Isolated Industry Converter Box	#247
Driver:	please see <a href="#">Drivers</a>	
Installing:	Plug & Play please see <a href="#">FAQs &amp; Doks</a>	
Chipset:	<a href="#">FTDI</a>	
Cable length:	1,8 m (optional 0,5 1,5 2,5 5,0)	
USB-Interface:	Virtual COM port (VCP) VCP drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.	
Connection 1:	USB2.0 (1.1)	
Pin assignment 1:	Pin 1 - USB Vcc Pin 2 - USB Data- Pin 3 - USB Data+ Pin 4 - USB GND	
Connection 2:	RS485 Sub-D 9 pol. Male	
Pin assignment 2:	Pin 1 - TX- (Z) - Converter Output Pin 2 - TX+ (Y) - Converter Output Pin 3 - RX+ (A) - Converter Input Pin 4 - RX- (B) - Converter Input Pin 5 - GND - Signal Ground Pin 6 - nc Pin 7 - nc Pin 8 - nc Pin 9 - Galvanically isolated +5V DC 120mA Output	
Terminating resistors:	9 switchable terminating resistors  <b>If all DIP switch 1..9 OFF then:</b>  RX+/- Terminating resistor 100K	

RX+ Pull Up resistor 100K  
 RX- Pull Down resistor 100K  
 TX+/- Terminating resistor 100K  
 TX+ Pull Up resistor 100K  
 TX- Pull Down resistor 100K

**Optional shiftable Terminating and Pull Up/Down resistors:**

- 1 DIL - RX+ Pull Up resistor 1K
- 2 DIL - RX Terminating resistor 120R
- 3 DIL - RX- Pull Down resistor 1K
  
- 4 DIL - TX+ Pull Up resistor 1K
- 5 DIL - TX Terminating resistor 120R
- 6 DIL - TX- Pull Down resistor 1K
  
- 7 DIL - TX+ Pull Up resistor 390R
- 8 DIL - TX Terminating resistor 220R
- 9 DIL - TX- Pull Down resistor 390R
  
- 10 DIL - Local Echo\_OFF  
 Halfduplex DIP 10 = ON / Fullduplex DIP 10 = OFF



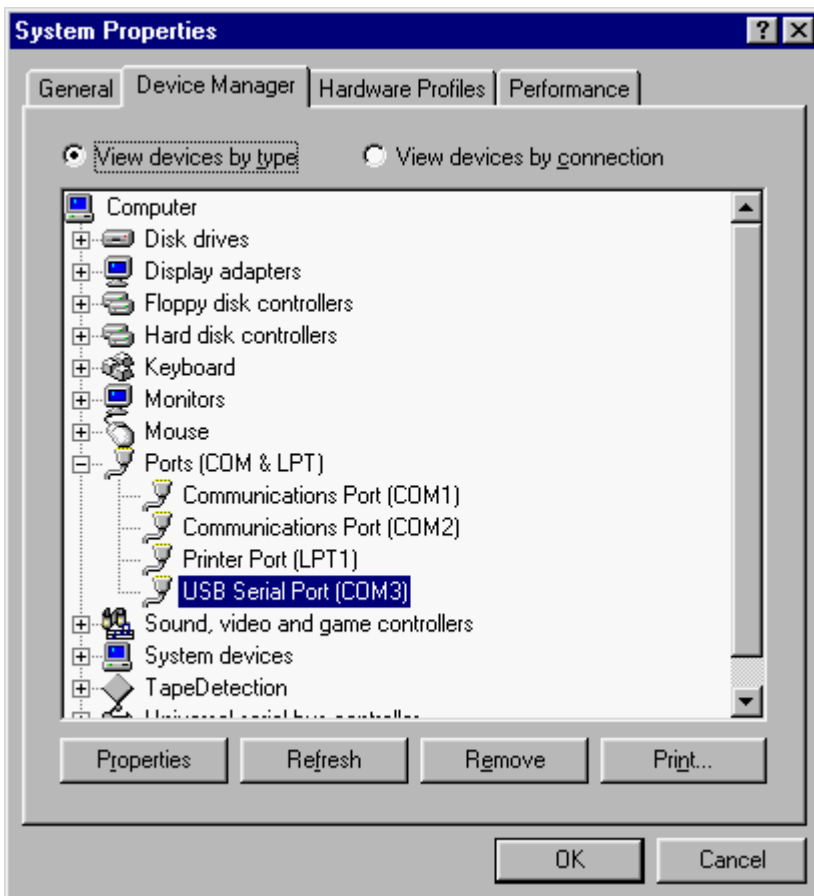
Connection 2 guard:

RS485 Receiver:  
 +/- 15 kV Human Body Model  
 +/- 6 kV IEC 1000-4-2, Contact Discharge  
 +/- 12 kV IEC 1000-4-2, Air-Gap Discharge  
 Allow Up to 128 Receivers on the Bus  
 True-Fail-Safe Receiver  
 -7V .. +12V Common-Mode Range  
 Thermal Protection Against Output Short Circuit  
 RS485 Driver:  
 +/- 9 kV Human Body Model

	Slew-Rate Limited for Errorless Data Transmission -7V .. +12V Common-Mode Range Current Limiting Thermal Shutdown for Driver-Overload Protection	
Handshake:	no X-On / X-Off	
TX/RX switching:	automatic	
Transmission lines:	2-Wires Halfduplex or 4-Wires Fullduplex	
Galvanic Isolation:	High common-mode transient immunity: >25 kV/μs Safety and regulatory approvals UL recognition: 5000 V rms for 1 minute per UL 1577 CSA Component Acceptance Notice #5A IEC 60950-1: 600 V rms (reinforced) IEC 60601-1: 250 V rms (reinforced) VDE certificate of conformity DIN V VDE V 0884-10 (VDE V 0884-10):2006-12 VIORM = 846 V peak	
Galvanic Isolation Docs:	<b><u>DC/DC converter 6KV</u></b> <b><u>Quad-Channel Digital Isolators</u></b> <b><u>FAQ: Isolation, iCoupler® Technology, and iCoupler Products</u></b>	
EMC-safe:	8 KV	
Data transfer rates:	183, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 11520, 230400, 460800, 921600 bps. TTL 3,3V and 5V up to 3000000 bps. <a href="#">Supported transfer rates PDF file</a>	
Status indication:	Red LED - TXD activity Green LED - RXD activity Green LED - +5V 120mA Output activity	
Operating temperature:	-10..+70°C	
Available Drivers:	Windows Vista, Windows Vista x64 Windows XP, Windows XP x64 Windows 2000  Windows Server 2008, Windows Server 2008 x64  Windows Server 2003, Windows Server 2003 x64  Windows 98, Windows ME  Mac OS X (Intel), Mac OS X, Mac OS 9, Mac OS 8  Linux, Linux x86_64  Windows CE 6.0, CE 4.2 - 5.2, Windows Mobile 6 Windows Mobile 5, PocketPC 2003 ARM/XScale Processor & x86 Processor  Windows CE 6.0 and CE 4.2 - 5.2 (Other Processors) - email support	

## Installing the USB-RS485 converter

The USB to RS485 converter is shipped with a Windows driver disk. When the converter is connected to the Windows based host computer, Windows will display the "Found New Hardware" screen and will prompt the user for a driver for the device. With the driver disk installed in drive "A", select the "Have Disk" option and browse the driver disk to the appropriate driver. Once installed, the USB converter will be assigned the next available COM port on the host computer. To verify the proper set-up, open the "System" icon in the "Control Panel" and click on the "Device Manager" tab. Under "Ports", there should now be a new COM port labeled "USB Serial Port".

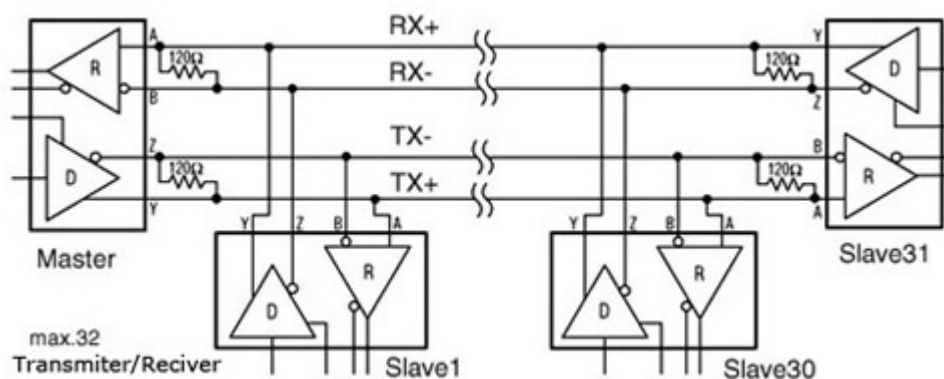


#### RS485 Info

EIA-485 only specifies electrical characteristics of the driver and the receiver. It does not specify or recommend any data protocol. EIA-485 enables the configuration of inexpensive local networks and multidrop communications links. It offers high data transmission speeds (35 Mbit/s up to 10 m and 100 kbit/s at 1200 m). Since it uses a differential balanced line over twisted pair (like EIA-422), it can span relatively large distances (up to 4000 feet or just over 1200 metres).

In contrast to EIA-422, which has a single driver circuit which cannot be switched off, EIA-485 drivers need to be put in transmit mode explicitly by asserting a signal to the driver. This allows EIA-485 to implement linear topologies using only two wires. The equipment located along a set of EIA-485 wires are interchangeably called nodes, stations and devices.

The recommended arrangement of the wires is as a connected series of point-to-point (multidropped) nodes, a line or bus, not a star, ring, or multiply-connected network. Ideally, the two ends of the cable will have a termination resistor connected across the two wires. Without termination resistors, reflections of fast driver edges can cause multiple data edges that can cause data corruption. Termination resistors also reduce electrical noise sensitivity due to the lower impedance, and bias resistors are required. The value of each termination resistor should be equal to the cable impedance (typically, 120 ohms for twisted pairs).



<b>RS422 and RS485 Standards</b>	<b>RS422</b>	<b>RS485</b>
Mode of operation	Differential	Differential
Allowed no. of Tx and Rx	1 Tx, 10 Rx	32 Tx 32 Rx
Maximum cable length	4000ft length	4000ft length
Maximum data rate	10 Mbps	10 Mbps
Minimum driver output range	±2V	±1,5V
Maximum driver output range	±5V	±5V
Maximum driver short-circuit current	150 mA	250 mA
Tx load impedance	100 Ohm	54 Ohm
Rx input sensitivity	±200 mV	±200 mV
Maximum Rx input resistance	4 kOhm	12 kOhm
Rx input voltage range	±7V	-7V to +12V
Rx logic high	>200 mV	>200mV
Rx logic low	<200mV	<200mV

**Cable length (m) = 100.000.000 / Baud (bps)**

Baud (kbps)	9600	19,2	38,4	115,2	250	500	750
Lenght (m)	10417	5208	2602	868	400	200	133
Baud (Mbps)	1	2	3	10			
Lenght (m)	100	50	33	10			

[More Infos - Wiki - RS485](#)