



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 <=> RS232 High Isolated Industry Converter Box (product no. #23A)

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Available versions:

USB <=> RS232 v.24 converter cable (USB 2.0 & 1.1) Version 5.2
USB <=> RS232 TTL 5V converter cable (USB 2.0 & 1.1) Version 5.2
USB <=> RS232 TTL 3V3 converter cable (USB 2.0 & 1.1) Version 5.2

Notes:

Extreme EMC-safe 8KV !
Extreme tough ! Designed for industry !
Available RS232 Outputs: V.24 or TTL 3V3 or TTL 5V !
Dimension outside boiler (mm) L 96 W 45 H 21 !
Low current consumption ! High-Speed Digital Isolator (no optocoupler) !

RS232 V.24 Receiver:

Latchup Free
Feature MegaBaud™ operation
ESD Protection for RS-232 I/O Pins:
±15kV—Human Body Model
±8kV—IEC 1000-4-2, Contact Discharge
±15kV—IEC 1000-4-2, Air-Gap Discharge
Guaranteed Data Rate 1 Mbps
Guaranteed Slew Rate 24V/μs
Meets EIA/TIA-232 Specifications Down to 3.0V
Ready-to-Transmit Logic-Level Output

RS232 TTL3V3 and 5V:

3 V/5 V level translation
Precise timing characteristics
2 ns maximum pulse width distortion
High common-mode transient immunity: >25 kV/μs
Input Supply Current per Channel, Quiescent IDDI (Q)
5 V/3 V Operation 0.50..0.53 mA
3 V/5 V Operation 0.26..0.31 mA
Output Supply Current per Channel, Quiescent IDDO (Q)
5 V/3 V Operation 0.11..0.14 mA
3 V/5 V Operation 0.19..0.21 mA
Input Dynamic Supply Current per Channel IDDI (D)
5 V/3 V Operation 0.19 mA/Mbps
3 V/5 V Operation 0.10 mA/Mbps
Output Dynamic Supply Current per Channel IDDO (D)
5 V/3 V Operation 0.03 mA/Mbps
3 V/5 V Operation 0.05 mA/Mbps

USB Modul:

USB Specification 2.0 & 1.1
Automatic "handshake mode"
Max. 1 Mbps "data transfer rate" V.24 version
Max. 3 Mbps "data transfer rate" TTL version
Aided "Remote wake-up" and power management
Plug & Play installing
Royal driver - FTDI Chipset

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

EMC-safe: 8 KV

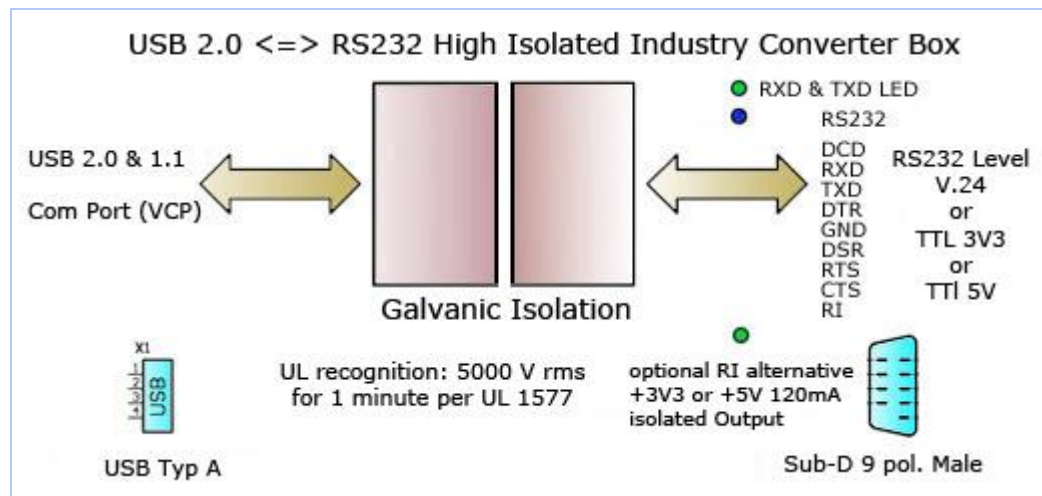
Excellent References:

Electric Power Company
 Harbor Pick-up Carrier
 With Ferrite - Shield Bead - 99,99 % reliability contra system crash

Extras:

Optional galvanically isolated +5V DC 120mA Output - RS232 RI Signal alternative
 - available on request! (without extra charge)

Block diagram



Converter images



Technical characteristics

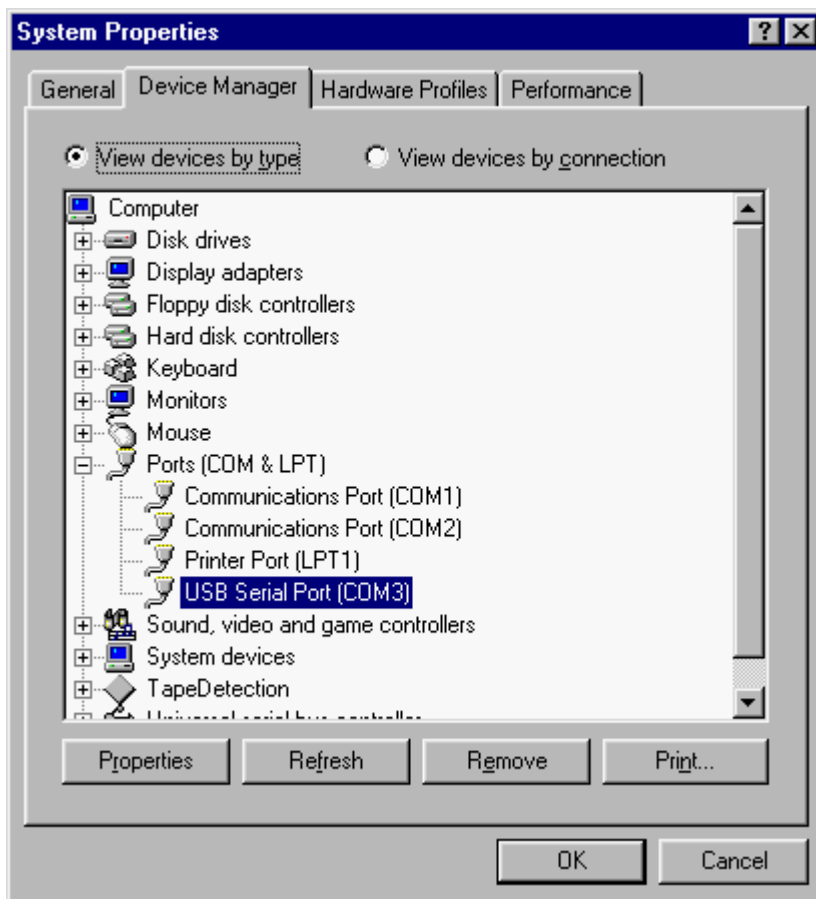
Product:	USB 2.0 <=> RS232 High Isolated Industry Converter Box	#23A
Driver:	please see Drivers	
Installing:	Plug & Play please see FAQs & Doks	
Chipset:	FTDI	
Cable length:	1,8 m (optional 0,5 1,5 2,5 5,0)	

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:	RS232 - V.24 or TTL 3V3 or TTL 5V - SUB-D 9 pol. Male	
Pin assignment 2:	Pin 1 - DCD - Converter Input Pin 2 - RXD - Converter Input Pin 3 - TXD - Converter Output Pin 4 - DTR - Converter Output Pin 5 - GND - Signal Ground Pin 6 - DSR - Converter Input Pin 7 - RTS - Converter Output Pin 8 - CTS - Converter Input Pin 9 - RI - Converter Input - optional 3V3 or 5V 120mA Output	
Connection 2 guard:	Latchup Free ESD Protection for RS-232 I/O Pins: ±15kV—Human Body Model ±8kV—IEC 1000-4-2, Contact Discharge ±15kV—IEC 1000-4-2, Air-Gap Discharge Guaranteed Data Rate 1 Mbps Guaranteed Slew Rate 24V/µs Meets EIA/TIA-232 Specifications Down to 3.0V Ready-to-Transmit Logic-Level Output	
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:	<u>DC/DC converter 6KV</u> <u>Quad-Channel Digital Isolators</u> <u>FAQ: Isolation, iCoupler® Technology, and iCoupler Products</u>	
EMC-safe:	8 KV	
Handshake:	no RTS / CTS DSR / DTR X-On / X-Off	
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. Supported transfer rates PDF file	
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-RS232 converter

The USB to RS232 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".



RS232 Info

In telecommunications, RS-232 (Recommended Standard 232) is a standard for serial binary data signals connecting between a DTE (Data Terminal Equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports. A similar ITU-T standard is V.24 .

Voltage levels

The RS-232 standard defines the voltage levels that correspond to logical one and logical zero levels. Valid signals are plus or minus 3 to 15 volts. The range near zero volts is not a valid RS-232 level; logic one is defined as a negative voltage, the signal condition is called marking, and has the functional significance of OFF. Logic zero is positive, the signal condition is spacing, and has the function ON. The standard specifies a maximum open-circuit voltage of 25 volts; signal levels of ± 5 V, ± 10 V, ± 12 V, and ± 15 V are all commonly seen depending on the power supplies available within a device. RS-232 drivers and receivers must be able to withstand indefinite short circuit to ground or to any voltage level up to ± 25 volts.

Signals

Commonly-used signals are:

Transmitted Data (TxD)

Data sent from DTE to DCE.

Received Data (RxD)

Data sent from DCE to DTE.

Request To Send (RTS)

Asserted (set to logic 0, positive voltage) by DTE to prepare DCE to receive data. This may require action on the part of the DCE, e.g. transmitting a carrier or reversing the direction of a half-duplex channel. For the modern usage of "RTS/CTS handshaking," see the section of that name.

Ready To Receive (RTR)

Asserted by DTE to indicate to DCE that DTE is ready to receive data. If in use, this signal appears on the pin that would otherwise be used for Request To Send, and the DCE assumes that RTS is always asserted; see RTS/CTS handshaking for details.

Clear To Send (CTS)

Asserted by DCE to acknowledge RTS and allow DTE to transmit. This signaling was originally used with half-duplex modems and by slave terminals on multidrop lines: The DTE would raise RTS to indicate that it had data to send, and the modem would raise CTS to indicate that transmission was possible. For the modern usage of "RTS/CTS handshaking," see the section of that name.

Data Terminal Ready (DTR)

Asserted by DTE to indicate that it is ready to be connected. If the DCE is a modem, this may "wake up" the modem, bringing it out of a power saving mode. This behaviour is seen quite often in modern PSTN and GSM modems. When this signal is de-asserted, the modem may return to its standby mode, immediately hanging up any calls in progress.

Data Set Ready (DSR)

Asserted by DCE to indicate the DCE is powered on and is ready to receive commands or data for transmission from the DTE. For example, if the DCE is a modem, DSR is asserted as soon as the modem is ready to receive dialing or other commands; DSR is not dependent on the connection to the remote DCE. If the DCE is not a modem (e.g. a null modem cable or other equipment), this signal should be permanently asserted (set to 0), possibly by a jumper to another signal.

Data Carrier Detect (DCD)

Asserted by DCE when a connection has been established with remote equipment.

Ring Indicator (RI)

Asserted by DCE when it detects a ring signal from the telephone line.

Maximum cable lengths

Cable length is one of the most discussed items in RS232 world. The standard has a clear answer, the maximum cable length is 50 feet, or the cable length equal to a capacitance of 2500 pF. The latter rule is often forgotten. This means that using a cable with low capacitance allows you to span longer distances without going beyond the limitations of the standard. If for example UTP CAT-5 cable is used with a typical capacitance of 17 pF/ft, the maximum allowed cable length is 147 feet.

The cable length mentioned in the standard allows maximum communication speed to occur. If speed is reduced by a factor 2 or 4, the maximum length increases dramatically. Texas Instruments has done some practical experiments years ago at different baud rates to test the maximum allowed cable lengths. Keep in mind, that the RS232 standard was originally developed for 20 kbps. By halving the maximum communication speed, the allowed cable length increases a factor ten!

Baud rate - Maximum cable length (ft)

19200 - 50
9600 - 500
4800 - 1000
2400 - 3000

Galvanic isolation

Galvanic isolation is the principle of isolating functional sections of electric systems so that charge-carrying particles cannot move from one section to another, i.e. there is no electric current flowing directly from one section to the next. Energy and/or information can still be exchanged between the sections by other means, however, such as by capacitance,

induction, electromagnetic waves, optical, acoustic, or mechanical means.

Galvanic isolation is used in situations where two or more electric circuits must communicate, but their grounds may be at different potentials. It is an effective method of breaking ground loops by preventing unwanted current from travelling between two units sharing a ground conductor. Galvanic isolation is also used for safety considerations, preventing accidental current from reaching the ground (the building floor) through a person's body.

[More Infos - Wiki - RS232](#)