

USB to RS-232 interface converter (USB to RS-232 and backwards)



TECHNICAL GUIDE

Review date: 7 June, 2015

Revision number: 1.01

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CONTENT

REVISION HISTORY3
PURPOSE OF THE DOCUMENT4
APPOINTMENT5
TECHNICAL SPECIFICATIONS5
CONSTRUCTION AND OPERATION8

REVISION HISTORY

REV	DATE	BY	SECTION	DESCRIPTION
1.01	2013.01.11	EV	All	First release

PURPOSE OF THE DOCUMENT

This Technical Guide is intended for studying of USB to RS-232 interface converter. It contains basic information regarding its interfaces and connectors, configuration and adjustments, connection to personal computer, cabling.

Due to a reason that USB to RS-232 interface converter is constantly being developed in direction of improvements of their possibilities, changes are possible in its final version, which is not described in given Technical Guide.

During the system development process given Technical Guide will be also expanded and updated and new chapters will be added. Latest version of this Technical Guide can be downloaded from the USB to RS-232 interface converter web-page: <http://www.technotrade.ua/usb-to-rs-232-interface-converter.html>.

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In case if you find any mistakes, omissions in this document or have any suggestions on improvements to this document, please feel free to e-mail them to our support mailbox: support_1a@technotrade.ua. We will be grateful to you for this valuable information.

All technical questions regarding the USB to RS-232 interface converter are welcome to be asked on support mailbox: support_1a@technotrade.ua. Our support team will be glad to help you.

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APPOINTMENT

USB to RS-232 interface converter is intended for conversion from USB interface (USB 1.1, USB 2.0) into two independent RS-232 interfaces in duplex and half-duplex modes of data exchange.

TECHNICAL SPECIFICATIONS

USB interface

Quantity of channels	1
Quantity of ports	2
Version of interface	USB 1.1, USB 2.0
Connector type	USBA-1J (Type «A») (male)
Signals	DATA+, DATA-

RS-232 interface

Quantity of channels	2
Connector type	DB-9M (male)
Data exchange mode	half-duplex, duplex
Connection scheme	9-wire
Signals	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
Baud rates	from 2 400 to 115 200 bit/sec
Data formats	8-N-1, 8-E-1, 8-O-1
Flow control	no, XON/XOFF, CTS/RTS
Word length	7 or 8 bits
Stop bits	1 or 1.5
Control bit	none, even, odd

Power supply

Source	USB interface
Voltage	5 V DC
Current consumption	100 mA (not more)

Area of application

Area of application	internal
Temperature range	0... + 55 °C
Exploitation mode	round-the-clock

Constructional

Dimensions	93 x 52 x 16 mm (not more)
Case material	ABS plastic
Weight	0.1 kg (not more)

RS-232 interface cable characteristics

Type	24AWG (5 category)
Active resistance	7 Ohm (100 meters of single wire)
Capacity	0,005 uF (100 meters of twisted pair)
Wave resistance	120 Ohm

Cable length and baud rate at data exchange on RS-232 interface

Baud rate (bits/sec)	Distance, m
230 400	15
115 200	25
57 600	50
38 400	80
19 200	120
14 400	160
9 600	200
1 200 – 4 800	200

Features**1. Power supply.**

Power supply is made from host-controller (power unit of personal computer) or from USB-hub with internal power supply +5 V.

2. Connection.

Connection is done to host-controller (system case of personal computer) or to USB-hub through cable USB-A, mounted into case of the converter. Peripheral devices with RS-232 interfaces is connected through DB-9F connectors (female).

3. Interaction of the personal computer with USB to RS-232 interface converter.

Physical USB-port of the converter – channel of USB interface, which is connected to computer or hub. Virtual USB-ports of the converter are created in Windows OS after connection of the physical USB-port to computer and installation of the converter drivers: “USB Serial Converter A” and “USB Serial Converter B”.

Physical COM-ports of the converter – channels of RS-232 interface, having names COM1 and COM2, to which external peripheral devices are connected. Virtual COM-ports of the converter are created in Windows OS after installation of the converter drivers. These program virtual ports correspond to physical COM-ports of the converter, which Windows OS gives names “COMx” with numbers from 1 to 256.

As a result with virtual COM-ports of the converter a software application can work as with general COM-ports and request to virtual COM from the application leads to control over physical port port of the converter.

4. FTDI FT4232H drivers.

Operational systems for FTDI drivers:

- Windows 8.1
- Windows 8.1 x64
- Windows 8
- Windows 8 x64
- Windows Server2012
- Windows Server 2008 R2
- Windows 7
- Windows 7 x64

- Windows Server 2008
- Windows Server 2008 x64
- Windows Vista
- Windows Vista x64
- Windows Server 2003
- Windows Server 2003 x64
- Windows XP
- Windows XP x64
- Windows ME
- Windows 98
- Linux
- Mac OS X
- Mac OS 9
- Mac OS 8
- Windows CE.NET (Version 4.2 and greater)
- Android
- Windows RT

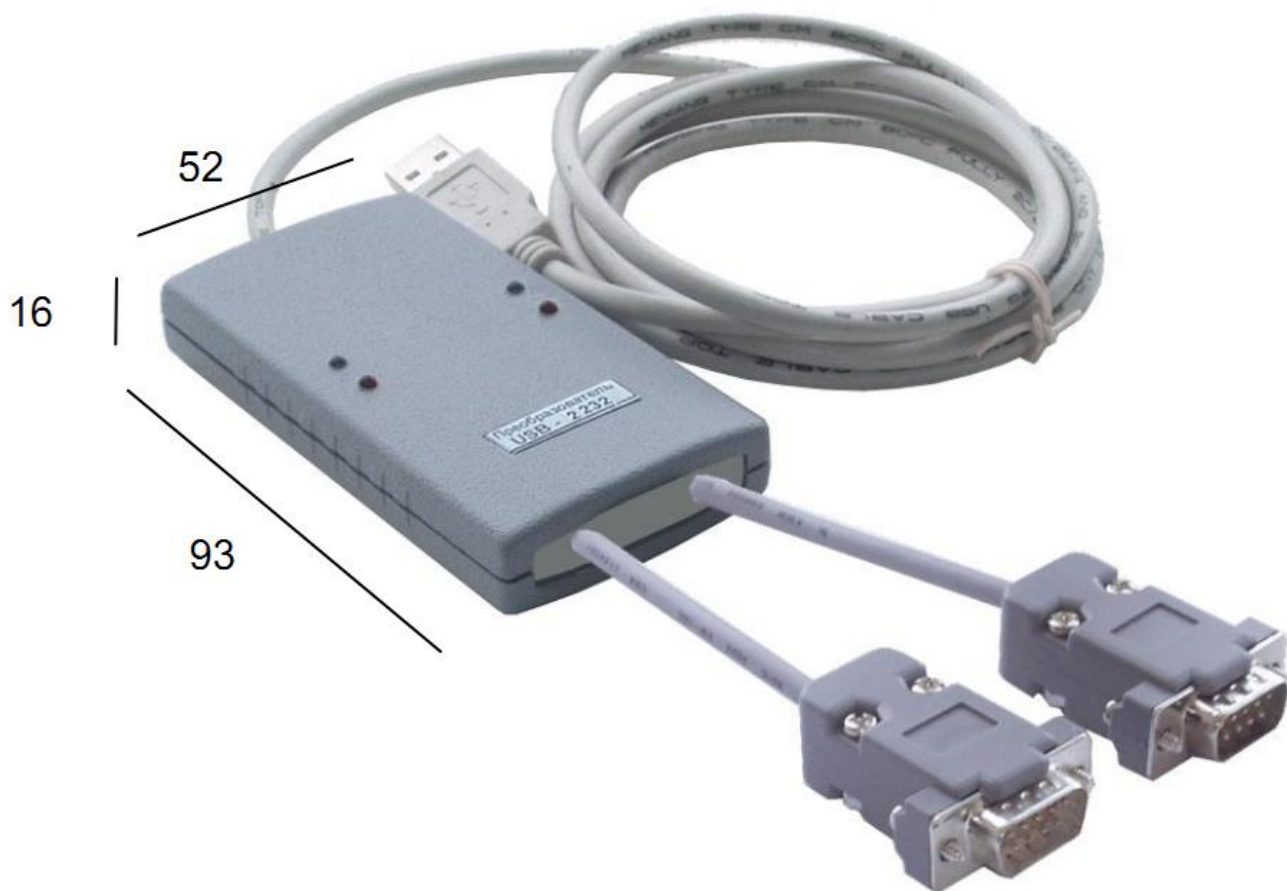
Support for WinCE

FTDI drivers are available for Windows CE 4.2-5.2, 6.0/7.0 and 2013.

All drivers can be downloaded from the web-site of the manufacturer of FT4232H chip:

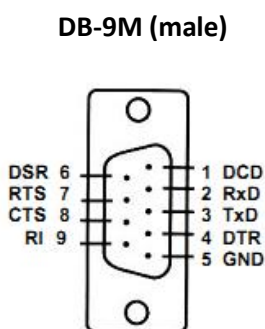
<http://www.ftdichip.com>.

CONSTRUCTION AND OPERATION



Material of case – ABS plastic
 Variant of case execution – for location on flat surface (table).

Location of signals of RS-232 interface on contacts of DB-9M connector (male)

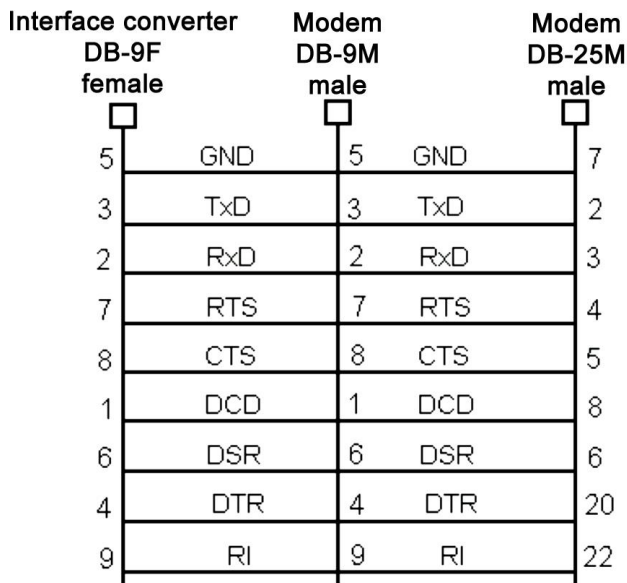


Contact	Signal	Function
1	DCD	Data Carrier Detect, input
2	RxD	Received Data, input
3	TxD	Transmitted Data, output
4	DTR	Data Terminal Ready, output
5	SG (GND)	Common Ground
6	DSR	Data Set Ready, input
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator, input

NOTE!

It is prohibited to connect or disconnect interface cable to RS-232 connector if power cables plugs of connected devices with RS-232 interface are connected to power supply source 220 V. This can lead to damage of transmitters of interface circuits of both devices.

Connection scheme of interface converter to modem



Connection scheme of interface converter to COM-port of personal computer (RTS/CTS protocol)

