



UCAB232

RS-232 interface for USB



Reference Manual

ASIX s.r.o.
Staropramenna 4
150 00 Prague
Czech Republic

www.asix.net

support@asix.net

sales@asix.net

ASIX s.r.o. reserves the right to make changes to this document, the latest version of which can be found on the Internet.

ASIX s.r.o. renounces responsibility for any damage caused by the use of ASIX s.r.o. products.

© Copyright by ASIX s.r.o.

Table of Contents

1 UCAB232	4
1.1 Package Contents	4
1.2 Features	4
1.3 Quick Start	4
1.3.1 Windows	4
1.3.2 Linux	4
1.4 How to use the UCAB232 converter	4
1.4.1 RS-232 interface	5
Data rate	5
1.4.2 LED indicators	5
1.4.3 Standby	5
1.4.4 Resistance to external influences	5
1.5 Technical Specification	6
1.5.1 Absolute Maximum Ratings	6
1.5.2 Operating Specifications	6
2 DRIVERS	7
2.1 Drivers Installation	7
2.1.1 Windows operation system	7
Windows 7 and newer	7
Windows XP	7
2.1.2 Linux operation system	7
2.2 Drivers Update	7
2.2.1 Windows 7	7
2.2.2 Windows XP	8
2.3 Troubleshooting and Special Requirements	8
2.3.1 High demands on time response	8

2.4 User OEM Application	9
3 Document history	10

1

UCAB232

Thank you for buying our product. If you have any question, please do not hesitate to contact our technical support.

1.1 Package Contents

- UCAB232 Converter
- CD-ROM with Drivers and User Guide
- Leaflet

1.2 Features

- Full RS-232 implementation
- High communication speed
 - 250 kBaud guaranteed
 - more than 500 kBaud typically
- Powered from USB, no additional power supply needed
- Standard 9-pin SubD connector
- Receive buffer 384 Byte
- Transmit buffer 128 Byte
- Full hardware flow control using RTS/CTS, DTR/DSR/DCD, hardware assisted XON/XOFF
- USB 2.0 compatible, Full speed
- Possibility to customize VID, PID for OEM products
- Drivers for Windows and Linux

- for OEM application, proprietary ID can be used
- Low power consumption (USB suspend mode)
- Cable length 1 m

1.3 Quick Start

It is necessary to install drivers before first use.

1.3.1 Windows

Please insert USB plug connector of your UCAB232i converter into PC USB port. The drivers are installed automatically from Microsoft update server.

1.3.2 Linux

LINUX kernel 2.6.31 or newer includes required drivers and there is no need to install them.

1.4 How to use the UCAB232 converter

UCAB232 adds an RS-232 interface to a USB equipped computer.

The converter is designated for all standard RS-232 devices (mouses, modems, data terminals, barcode readers, serial printers).

After installation the drivers a new COM port device will be ready to use by software applications in standard fashion (e.g. Win32 API function calls).

It is possible to set up the UCAB232i COM port number in the control panels.

1.4.1 RS-232 interface

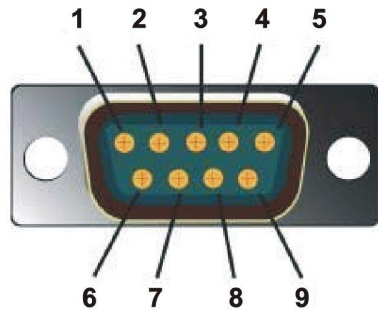


Fig.2: DB9, pins

UCAB232 provides all RS-232 signals.

The description of RS-232 signals is given bellow in the table:

Pin	Name	I/O	Description
1	DCD	IN	Data Carrier Detect
2	RD	IN	Receive Data
3	TD	OUT	Transmit Data
4	DTR	OUT	Data Terminal Ready
5	SG	PWR	Signal Ground
6	DSR	IN	Data Set Ready
7	RTS	OUT	Request to Send
8	CTS	IN	Clear to Send
9	RI	IN	Ring Indicator

Table 1: RS-232 signals description

Data rate

The guaranteed data rate is within the range of 300 Baud to 250 kBaud,

The UCAB232 converter allows to communicate typically over 500 kBaud. However, this data rate is not guaranteed and could depend on temperature and an external signal quality.

1.4.2 LED indicators

UCAB232 is equipped with two LED indicators.

Red LED: data are being sent from PC to a RS-232 connected device

Green LED: data are being sent from a RS-232 connected device to PC

1.4.3 Standby

The UCAB232 converter fully supports PC standby mode (sleep).

1.4.4 Resistance to external influences

The operating temperature range is between 0 °C to +70 °C.

The converter complies the IP20 specification.

1.5 Technical Specification

1.5.1 Absolute Maximum Ratings

Operating temperature	min. 0 °C	max. +70 °C
Storage temperature	min. -55 °C	max. +85 °C
Active USB current	max. 100 mA	
All input voltages to signal ground	±25 V	
All output voltages to signal ground	±13 V	
ESD immunity	±8 kV contact HBM	
	±6 kV air HBM	
	±15 kV Human Body Model	
Electric Field Immunity	3 V / m	

Table 2: Absolute Maximum Ratings

1.5.2 Operating Specifications

Minimum data rate	300 Baud
Maximum data rate	220 kBaud guaranteed, 500 kBaud typically
Input Treshold Low RS-232	min. 0.8 V, typ. 1.5 V
Input Treshold High RS-232	max. 2.4 V, typ. 1.8 V
Output voltage Swing ¹	min. ±5 V, typ. ±5.4 V
Short-circuit tolerance	No limit
Short-circuit current	maximum ±60 mA

Operating system	Windows ² 32/ 64-bit
	Linux 1.5.0 32/64-bit
	MAC OS 10 32/64-bit
	Windows CE ³
RS-232	full implementation
RS-232 connector	DB9
USB 1.1 a 2.0 compatibility	yes, 12 Mbps (Full Speed)
USB connector	A type
Length of USB cable	1 m
Transmit indicator	red LED
Receive indicator	green LED

Table 3: Operating Range

¹ Outputs Loaded with 3 kΩ.

² Windows 8, Windows 7, Windows Server, Windows Server 2003, Windows Vista, Windows XP. Compatible with 32/64 bit. version.

³ Windows Mobile 2003, Windows Mobile 2003 SE, Windows Mobile 5, Windows Mobile 6, Windows Mobile 6.1, Windows Mobile 6.5

2

DRIVERS

In this chapter, we will discuss drivers installation, drivers updating and specific COM port setting requirements.

2.1 Drivers Installation

2.1.1 Windows operation system

The driver installation runs automatically from Windows Update. In case the computer is not on the internet, it is possible to download the drivers from FTDI corp. (www.ftdichip.com) and install them manually in the device manager.

Notes:

It is possible to set up the converter COM port number in the control panels.

Windows 7 and newer

With Windows 7 operation system drivers are installed automatically from Microsoft update server every time the UCAB232 converter has been inserted into USB port. The successful installation is indicated by a message.

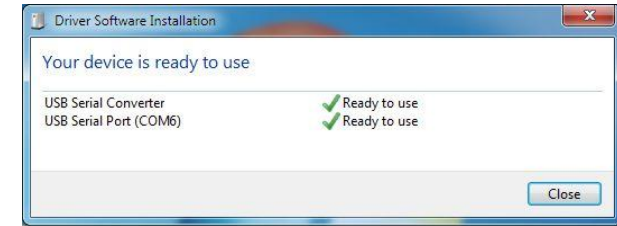


Fig.3: Drivers installation

Windows XP

When a new device has been detected by operating system it is necessary to agree searching the drivers on the Windows Update and continue with automatic installation. The installation continues then in two steps, first the converter driver and then the virtual COM port driver are being installed. After the installation the UCAB232 converter is ready for use.

2.1.2 Linux operation system

LINUX kernel 2.6.31 or newer includes required drivers and there is no need to install them. If you use operation system based on that kernel, the UCAB232 converter will simply start to work when it has been inserted into USB port.

2.2 Drivers Update

UCAB232 is based on FTDI IC, FTDI Chip company www.ftdichip.com steadily updates drivers for their ICs. To keep your drivers updated follow this chapter.

2.2.1 Windows 7

Signed drivers are automatically downloaded from Microsoft update server when the UCAB232 converter has been inserted into USB port. Every time operation system

is being updated, drivers are kept updated, too.

Another way how to update drivers in Windows 7 is very complicated or rather impossible.

2.2.2 Windows XP

Windows XP drivers are stable for a long time, thus there is usually no reason for update them with the exception that another software application using FTDI IC on the same PC requires it. In that case, drivers are available for download at www.ftdichip.com

2.3 Troubleshooting and Special Requirements

Some of applications have special requirements for RS-232 communication, which demand particular correct settings of the UCAB232 converter.

If there is any difficulty in communication between the RS-232 connected device and PC try options listed below.

Red LED indicates transmitting, it can serve as a check on that software application sends data to a correct PC port. In other case, please check the COM port number in software application and the assigned COM port number by operating system.

The COM port number can be found and/or changed in Control Panel/Device Manager/Ports.

If the RS-232 connected device does not reply (LED indicator does not blink) although software application sends data, it is possible that there is not correctly set „Baud rate“ (communication speed), „Data bits“, „Parity“, „Stop bits“ or „Flow control“. Please check that the settings meets specification of the RS-232 connected device.

2.3.1 High demands on time response

If the connected device replies (LED indicator blinks) but software application still does not receive data it is possible that the software application has high demands on time response.

The way of communication through USB is very different than communication through RS-232. USB uses packets of 64 B size. Furthermore, a RS-232 device can receive only on PC request. Hence it is almost impossible to assure time response lower than about 1 ms.

Time response settings can be done in Control Panel/Device Manager/Ports/.../Port Settings/ /Latency Timer. In case of troubles set this number to 1 ms.

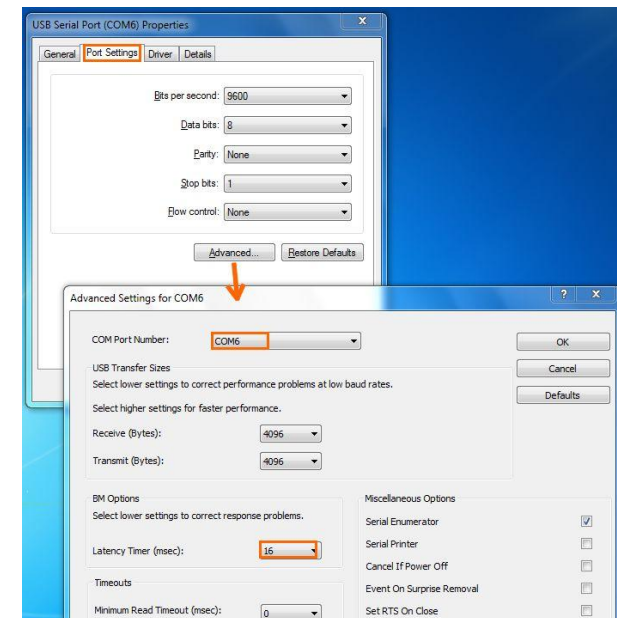


Fig.4: COM port Enhanced Settings

2.4 User OEM Application

The \$UCAB converter allows user to design an OEM application after which the converter is found and listed as a customer hardware.

For doing this, it is necessary to modify drivers, particularly, to change the UCAB232 converter VID and PID, which are originally set to 0403 / 6001, to customer numbers and write these numbers with the FT_PROG utility to the converter EEPROM.

Before a modification of EEPROM it is advisable to create a backup of EEPROM in case there is any trouble with VID/PID identifiers.

For smooth installation of modified driver on Windows 7 a newer the digital sign of the driver will be requested. For more information about driver sign see the web pages of Microsoft corporation.

3

Document history

Document revision	Modifications made
2014-05-30	Newly created document.
2014-06-11	Drivers section updated