



# UCAB232

RS232 interface for USB



**Reference Manual**

ASIX s.r.o.  
Na Popelce 38/17  
150 00 Prague  
Czech Republic

[www.asix.net](http://www.asix.net)

[support@asix.net](mailto:support@asix.net)

[sales@asix.net](mailto:sales@asix.net)

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# 1

## UCAB232

UCAB232 is a USB to RS232 converter suitable for connection of most RS232 devices to a PC using a USB port (e.g. mice, modems, data terminals, SmartCard readers, serial printers, measuring instruments with a serial port, industrial applications not requiring galvanic isolation, etc.).

### 1.1 Package Contents

- UCAB232 Converter
- Leaflet

### 1.2 Features

- Full RS232 implementation
- Based on FT232R
- Communication speed:  
300 Baud - 250 kBaud, typ. to 500 kBaud
- Powered from USB
- Standard 9-pin SubD connector
- Receive buffer: 256 Byte
- Transmit buffer: 128 Byte
- Full hardware flow control using RTS/CTS, DTR/DSR, DCD, RI, hardware assisted XON/XOFF
- USB 1.1 and USB 2.0 compatible
- Possibility to customize VID, PID and its text ID for OEM products
- Drivers for Windows, Linux and Mac OS
- Low consumption mode support (USB suspend mode)
- Cable length: 1 m

## 1.3 Usage

After connection the UCAB232 to a computer and installing its drivers (see chapter Drivers) there will be added a new COM port to the operating system. The port can be accessed the standard way (e.g. using Win32 API functions).

It is possible to set the UCAB232 COM port number in the port properties in the Device manager.

### 1.3.1 RS232 interface

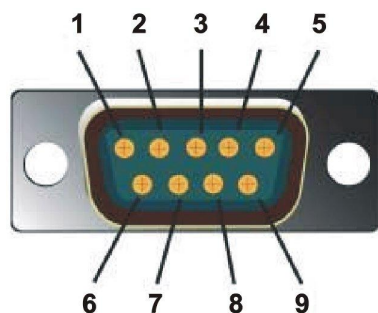


Fig. 2: DB9, pins

UCAB232 provides all RS232 signals.

The description of RS232 signals is given in the following 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: RS232 signals description

### Data rate

The data rate is within the range of 300 Baud to 250 kBaud, the converter is typically able to communicate faster but this cannot be guaranteed. The usability for higher speeds can depend on temperature and signal quality of the connected device.

### 1.3.2 LED indicators

UCAB232 is equipped with two LED indicators.

Red LED: data are being sent from PC to a RS232 connected device

Green LED: data are being sent from a RS232 connected device to PC

### 1.3.3 Standby

The UCAB232 converter supports PC standby mode (sleep).

## 1.4 Technical Specification

### 1.4.1 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

### 1.4.2 Operating Specifications

Minimum data rate	300 Baud
Maximum data rate	250 kBaud, 500 kBaud typ.
Supply current	typ. 15 mA, in idle typ. 10 mA
Supply current in sleep	typ. 233 µA
Input Treshold Low RS232	min. 0.8 V, typ. 1.5 V
Input Treshold High RS232	max. 2.4 V, typ. 1.8 V
Output voltage Swing <sup>1</sup>	min. ±5 V, typ. ±5.4 V
Short-circuit tolerance	No limit
Short-circuit current	maximum ±60 mA

Operating system	Windows <sup>2</sup> 32/ 64-bit
	Linux 1.5.0 32/64-bit
	MAC OS 10 32/64-bit
	Windows CE <sup>3</sup>
RS232	full implementation
RS232 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
IP Code	IP20

Table 3: Operating Range

<sup>1</sup> Outputs Loaded with 3 kΩ.

<sup>2</sup> Windows 10, Windows 8, Windows 7, Windows Server, Windows Server 2003, Windows Vista, Windows XP. Compatible with 32/64 bit. version.

<sup>3</sup> 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 and specific COM port setting requirements.

### 2.1 Drivers Installation

#### 2.1.1 Windows

Drivers installation runs automatically from Windows Update. In case the computer is not on the Internet the drivers have to be manually installed same as for older Windows versions.

**Note:**

It is possible to set the converter COM port number in the Device manager.

#### Windows 7 and newer

With Windows 7 and newer the drivers are automatically installed from Windows Update after the UCAB232 cable has been connected to USB port. A message shown after the installation reports that the cable is ready to use.

Windows 10 does not show this message.

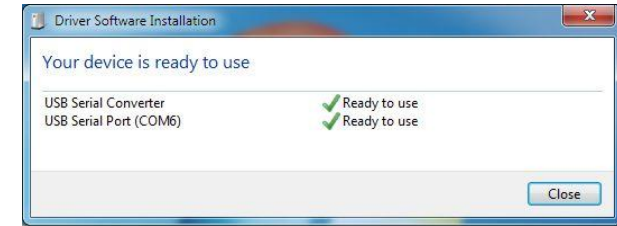


Fig. 3: Drivers installation

The drivers update automatically when the operating system updates.

#### Older Windows versions

In case of older Windows versions where the drivers do not install automatically they have to be downloaded from FTDI web (<https://www.ftdichip.com>).

Use VCP drivers (= Virtual COM Port).

The downloaded drivers have to be unpacked somewhere and when the system finds the cable as a new device the path to the unpacked drivers has to be provided to the installer. Or the drivers can be manually installed in the Device manager.

The installation is a two steps process, first it installs the converter driver then it installs the virtual COM port driver.

After the drivers are installed the cable is ready to use.

#### 2.1.2 Linux

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

There is a `ftdi_sio` module. Most of GNU/Linux distributions is supplied with compiled `ftdi_sio` module. The module version has to be 1.6.0 or newer. In most distributions the `ftdi_sio` module is automatically loaded after the cable has been connected to a USB port.

## 2.2 Troubleshooting and Special Requirements

Some applications have special requirements for RS232 communication because of which the cable has to be particularly configured.

If there are difficulties in communication between the RS232 connected device and the PC there are several things to be checked.

Using the red LED it can be checked that the software application sends data on the correct PC port.

When the red LED is not blinking, no data are being transmitted by the software. This can happen when the application sends data to a different COM port number.

The COM port number can be checked and modified in the Ports section of the Device manager.

When the software sends some data but the connected device does not reply (green LED is not blinking), 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 connected device.

### 2.2.1 Short time response needed

If the connected device replies (green LED indicator blinks) but software application still does not receive data it is possible that the application needs shorter time response.

The USB communication works a different way than the RS232 communication. USB sends 64 B long packets. Furthermore, the device connected on the RS232 side can send its response only on the PC request. Because of this it is very difficult to achieve the response time under 1 ms.

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

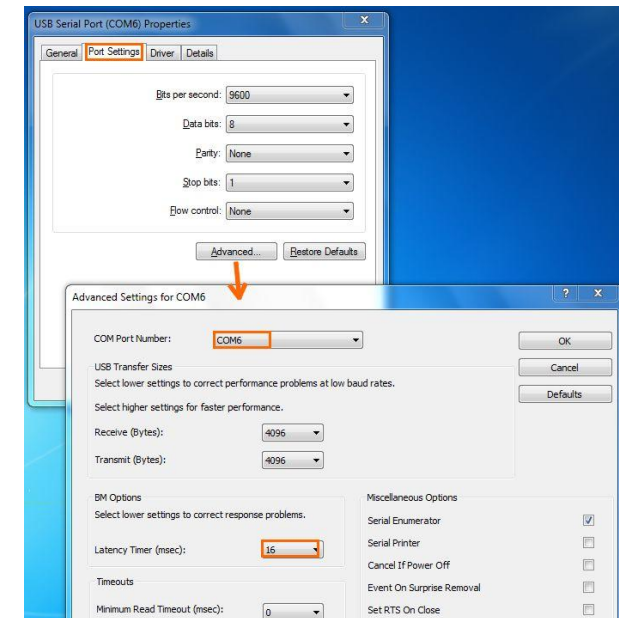


Fig. 4: COM port Enhanced Settings

## 2.3 User OEM Application

The UCAB232 converter enables user to make an OEM application, then the converter is reported as a customer hardware.

To do this the drivers have to be modified to change the converter VID and PID, which are originally set to 0403 / 6001, to customer numbers and using FT\_PROG utility to write these numbers to the converter EEPROM.

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

For smooth installation of the modified driver on



Windows 7 and later the driver will have to be digitally signed. For more information on drivers signing see Microsoft web.

In Linux, the new VID and PID parameters have to be supplied to the ftdi\_sio module when it is loaded.

# 3

## Document history

Document revision	Modifications made
2014-05-30	Newly created document.
2014-06-11	Drivers section updated.
2021-01-04	Manual updated, address updated.
	Drivers chapter was updated.