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USB Driver Installation (Windows)

Installation Guidance for the PC/SC and the USB-to-Virtual-COM-Port Drivers

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Howto

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1 Introduction

It is necessary to install a driver in order to connect to a BALTECH ID-engine device via its USB interface. For Windows 2000/XP/Vista systems, two competing drivers are available, the **USB-to-Virtual-COM-Port Driver** and the **PC/SC Driver**. Please notice that for Vista support at least the driver version 1.02.03 (PCSC) / 4.40.01 (Virtual COM Port Driver) is needed.

In → 2 Which USB Driver Shall I Use?, the pros and cons of these two alternatives are explained. The chapter contains some technical details that are necessary to fully understand the necessity of two drivers as well as their advantages and drawbacks. The impatient reader, however, may skip this chapter and just follow this simple guideline:

Only PC/SC applications should use the PC/SC Driver, all other applications benefit from the USB-to-Virtual-COM-Port Driver since apart from the PC/SC functionality, it provides the same functional range and is easier to use.

The following chapters → 3 Install a Reader as USB-to-Virtual-COM-Port Device and → 4 Install a Reader as PC/SC Device describe the installation procedures for the USB-to-Virtual-COM-Port Driver and the PC/SC Driver, respectively. Chapter → 6 Use Both Drivers on a Single PC is probably only interesting for people that either work with several ID-engine devices or have to switch between both drivers.

2 Which USB Driver Shall I Use?

This chapter shall give an answer to the question which driver to use for an ID-engine USB device. The first two sub chapters describe the two driver alternatives in detail before the third subchapter will give a definite answer to this issue, considering different use-cases.

2.1 The USB-to-Virtual-COM-Port Driver

As the name implies, the **USB-to-Virtual-COM-Port Driver**, in short **Virtual-COM-Port Driver**, installs a virtual COM-Port in the system. The host application can use this virtual COM-Port as if it were a real RS-232 port. Thus, the application will not see any differences between an ID-engine connected to the RS-232 port of a PC and an ID-engine connected via USB. Existing applications using the ID-engine can be used without any change also with ID-engine USB devices.

The USB-to-Virtual-COM-Port Driver allows for maximum **communication performance**. Besides the standard baud rates known from real RS-232 ports, also 576000 baud and 921600 baud are supported.

The support of all baud rates as well as the fact that there is no internal logic in the driver provides the user **full control** over the ID-engine. Of course, the *BALTECH* **BRP Driver Package** (see ↗ BRP Driver Package) is designed to be used with the USB-to-Virtual-COM-Port Driver.

2.2 PC/SC Driver

PC/SC is a standard describing the collaboration of different hardware and software components dealing with smart cards. Modern PC operating systems implement a PC/SC-compliant infrastructure that can be used by application programs. In order to integrate a PC/SC-compliant device in this framework, a PC/SC-device driver is needed.

BALTECH provides the **PC/SC Driver** for Windows 2000/XP/Vista. It provides the classical PC/SC interface for exchange of APDUs known from contact-based smart cards. Amongst others, the driver offers the possibility to interchange a contact-based system by a contactless system using the ID-engine in combination with suitable contactless smart cards without the need to change the host application. In order to enable the PC/SC framework to detect "inserted" cards immediately so that they can be reported to the PC/SC application, the PC/SC driver has to scan for cards permanently. The driver hands on this task to the ID-engine which consequently is constantly trying to select a card or label.

Besides the actual PC/SC interface, the driver also provides a so-called **raw channel** which also allows for those features of the ID-engine which cannot be mapped to the PC/SC interface by the driver. All BRP (see ↗ BRP interface description) commands can be invoked via this raw channel as with the USB-to-Virtual-COM-Port Driver. However, the raw channel does not appear in the form of a virtual COM-Port on the system. In fact, it can only be used via proprietary I/O controls. However, the task of permanent card scanning interferes with the invocation of BRP commands via the raw channel. Thus, the actual PC/SC interface has to be disabled manually before the raw channel can be used.

! The raw channel cannot be used in combination with the PC/SC interface and the latter has to be disabled before reader commands can be invoked via BRP.

The raw channel is also supported by the **BRP Driver Package** (see ↗ BRP Driver Package). I.e. existing Windows applications which are built upon the BRP Driver Package and which so far either used a real RS-232 connection or the USB-to-Virtual-COM-Port Driver, can easily switch to the PC/SC Driver. For this purpose, only the very piece of code responsible for opening the connection would have to be adapted. Please refer to ↗ PC/SC Driver for a description of how to switch between the two drivers.

Of course, only one of the drivers, either the USB-to-Virtual-COM-Port Driver or the PC/SC driver, can be installed for a certain ID-engine device at the same time. In order to switch from one driver to the other, the ID-engine has to be fully uninstalled first before installing the new driver.

The PC/SC driver allows for maximum **communication performance**. However, not all baud rates that are supported by the ID-engine are also supported by the driver. In fact, it only supports 115200 baud, 576000 baud and 921600 baud. Once an ID-engine is connected successfully at 115200 baud, the driver automatically switches to 576000 baud in order to improve communication performance. For this purpose, it does **not** set the appropriate configuration value BAUDRATE (see ↗ Configuration Values reference manual) but invokes the BRP command SetCommParam (see ↗ System reference manual). Thus, the ID-engine will use 115200 baud again after the next reset.

! A connection via the PC/SC Driver has to be closed and reopened in the case of a reader reset invoked via the raw channel. The reason for that is the automatic switch to 576000 baud.

2.3 Considerations

Applications relying on the Windows PC/SC framework undoubtedly need to use the PC/SC driver. Almost all other applications principally have the choice between two driver variants. The only two exceptions are applications that need to run at low baud rates and applications that require a COM-Port, e.g. using an ID-engine for keyboard entry emulation. Those applications definitely have to use the USB-to-Virtual-COM-Port Driver.

Both drivers provide full communication performance up to 921600 baud. However, only the USB-to-Virtual-COM-Port driver provides full control over the ID-engine since the PC/SC Driver does not support all baud rates that are supported by the ID-engine. This could be an issue in case of unintentional reconfiguration of the reader. In the worst case, the PC/SC driver will not any longer be able to connect to the device. Furthermore, usage of the PC/SC driver denotes additional complexity due its internal logic that is not needed for pure BRP applications, especially the automatic card scanning. Therefore, *BALTECH* advises to use the USB-to-Virtual-COM-Port Driver if the PC/SC interface is not needed. → Table 2.1 summarizes the mentioned issues.

Use Case	USB-to-Virtual-COM-Port Driver	PC/SC Driver
PC/SC application		√
Keyboard Entry Emulation	√	
BRP application using BRP Driver Package	√	√
Legacy BRP application using the BRP Driver Package (maybe rebuild of application necessary)	√	√
BRP application using proprietary BRP implementation	√	√
Legacy BRP application using a proprietary BRP implementation	√	

Table 2.1 Summary: Use cases and driver support

3 Install a Reader as USB-to-Virtual-COM-Port Device

To access a BALTECH USB reader via the Windows COM-port interface, the USB-to-Virtual-COM-Port Driver has to be installed. By using this driver, the hardware interface between reader and PC (USB or RS-232) gets transparent to the windows application.

Before the installation, the USB-to-Virtual-COM-Port Driver ZIP file which is part of the ID-engine Explorer Package (2100_usb_to_virtual_com_port_driver.zip) has to be unpacked into an arbitrary directory.

Starting with release 4.38.04 of the driver, BALTECH ships a BaltechVCPInstall.exe as part of the packages. The usage of this installer is optional, but BALTECH strongly recommends to start this installer **before** plug in the reader the first time. It can also be used to update an already installed, older version of the driver. In the second case the software requires a restart of windows after installation.

! The following guide must only be used if the BALTECH PC/SC Driver was never installed on this PC in the past. Even if it was installed and uninstalled again later, this way may not work. Please refer to → 6 Use Both Drivers on a Single PC instead.

The installation is started by connecting the USB reader to the PC for the first time. This will open the windows hardware wizard automatically. The first page of the hardware wizard asks if a windows update shall be done. You may skip this step by selecting the last item of the list and clicking 'Next'.



The next step specifies if an already installed driver shall be used or a third party driver.

If the BaltechVCPInstall.exe was run sometime before the installation, you may select “Install the software automaticially” and skip the following dialog. Otherwise “Install from a list or specific location” has to be selected.

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