

**SOFTWARE SPECIFICATIONS REPORT****SERIAL EMULATION USB DRIVER**

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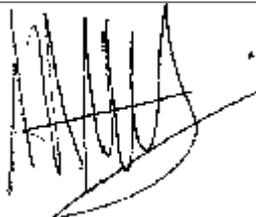
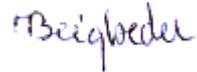
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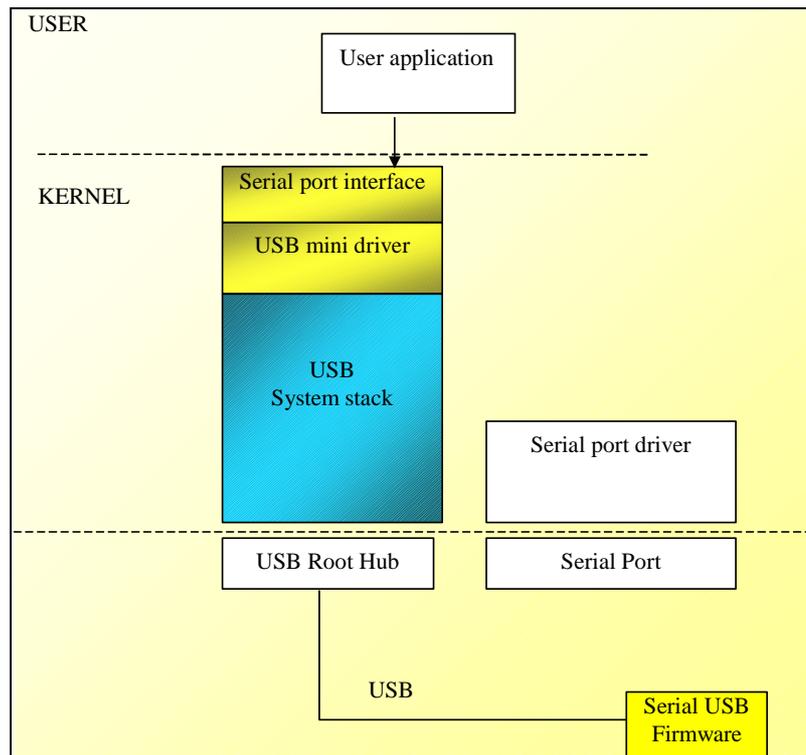
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1. GOALS

This document presents the functionalities of **Philog**'s USB serial emulation driver under Windows.

The driver is a **Philog**'s software component, designed for Windows 98, 98SE, Millenium, Windows 2000 and Windows XP. This driver registers the peripheral as a virtual serial port than cannot be distinguished from a classical COM port by any user application.



2. REFERENCE DOCUMENTATION

#	Reference	Date	Title
[1]	USBCDC1.1	19/01/1999	USB Class Definitions for Communication Devices

3. TERMINOLOGY

<i>ACM</i>	Abstract Control Model
<i>IAD</i>	Interface Association Descriptor
<i>USB</i>	Universal Serial Bus
<i>USB CDC</i>	USB Communication Device Class
<i>USB-IF</i>	USB Implementers Forum
<i>WDM</i>	Windows Driver Model

4. FUNCTIONALITIES OF THE DRIVER

4.1 HOT PLUG AND PLAY AND POWER MANAGEMENT

The driver is a WDM kernel driver. It can stand the hot plug and play of peripherals.

If a peripheral is removed when while being used, the TERMINAL PRESENT modem signal is set down indicating that the peripheral is no longer available. Reading or writing requests will be completed with an error.

The driver supports the standby mode and the hibernate mode.

The driver supports devices with the remote wake-up capability, enabling system wake-up by the USB device (this feature must also be enabled in the BIOS).

4.2 USB INTERFACE

The driver has been designed for a **communication class – abstract control model** peripheral.

The USB CLASS requests supported by the driver are :

- SET_CONTROL_LINE_STATE,
- SET_LINE_CODING,
- GET_LINE_CODING,
- SERIAL_STATE notification on the INTERRUPT pipe.

The driver does not manage the break, neither in the SERIAL_STATE notification nor as a command send by the PC.

ACM descriptors are not taken into account.

Alternate modes are possible:

- Possibility to group all the endpoints in a single interface (implementation of CDC multi-function peripherals + other class without using the IAD),
- Possibility to run only with two BULK pipes (no notification of MODEM signals).

Driver version 3.4 and above support the **communication class – OBEX** devices

4.3 SERIAL INTERFACE

4.3.1 RESERVATION OF THE COM PORT

When a peripheral that is managed by the *Philog*' s driver is plugged, a COM port number is reserved and the peripheral is registered in the system as a serial port. The driver dynamically assigns the COM port number. It corresponds to the first available COM port. For that, it takes into account the other types of drivers (IRDA, PCMCIA,...) creating some virtual ports in order to prevent any conflict.

- If the USB peripheral has a serial number (valid serial number chain defined in the device descriptor), the driver's COM port number is fixed.
- If the USB peripheral does not have any serial number, the COM port number depends on the bus topology (a peripheral that is connected to the #1 USB port of the PC will get, for example, the COM4 port number; if it s connected to the #2 USB port of the PC, it will get the COM5 port number).

A *Philog*' s specific mechanism detects the “dead” COM port numbers and retrieve them (avoid COM port loss due to system crash).

4.3.2 INTERFACE WITH THE USER LAYER

For a user application, the virtual COM port cannot be distinguished from a physical port.

All COM_API functions are supported as follows:

- The driver does not manage the BREAK signal. **ClearCommBreak** and **SetCommBreak** are kept to guaranty the compatibility,
- All the events that are used through **SetCommMask** and **WaitCommEvent** are supported except for the events concerning the BREAK signal,

- Any Timeouts types are supported,
- The configuration of the line (baudrate, parity, DTR ...) is sent to the USB peripheral via the USB SET_LINE_CODING and GET_LINE_CODING commands,
- The MODEM signals are managed. The CTS is emulated because it is not among the signals that are sent by the SERIAL_STATE notification,
- FIFO sizes can be defined.

4.4 DATA RATE AND BAUDRATE

The configuration of the line is sent to the peripheral via the USB SET_LINE_CODING command. Nevertheless, these information have no influence on the USB bus throughput.

The **Philog** 's driver enables to get data rate above 10Mbps in USB FULL SPEED.

5. OPERATING SPECIFICATIONS

5.1 ENVIRONMENT

The driver exists for Windows 9x, ME as well as for Windows 2000 and XP.

Considering the instabilities of the USB stack reported by Microsoft, we recommend the Windows 2000 SP4 and Windows XP SP1 or SP2 Operating Systems.

5.2 SETUP

The driver is supplied with a .inf file enabling the system to install it when the peripheral is connected for the first time.

The system can consider the peripheral as a modem or a serial port.

The driver can also be supplied as an InstallShield process for the French and English OS. The associated un-installation process is complete (withdrawal from the registry of all the keys created by Windows, withdrawal of the .pnf files generated by the system,...).