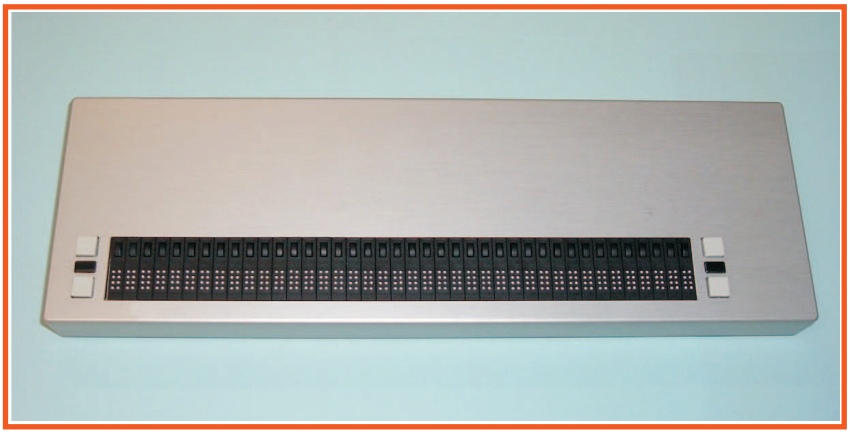
Braille Display BD-40 USB Electronic



Abstract

The USB Interface connects a PC with a Braille Line assembled with metec Braille Modules (B11 or B16)
This Doku is valid for the USB-Device 01#00.

Installing the Driver

First connect the USB Interfaceto the PC. When there is no matching driver the Operating System requests one.
Choose the folder where metecUSB.sys and metecUSB.inf is loacated.
The driver fits for Windows98, WindowsME, Windows2000 and WindowsXP.

Testapplication USB_tst

This application is only used to demonstrate the function.
When the device is connected and the driver is loaded, the High Voltage of the device is switched on.
The message “High Voltage is On!“ is displayed.
Then you have to enter the number of modules.
In the white Line you can enter a text that is shown on the Braille Line.
In the field “CursorPosition” the Number of the switched Cursor key is shown.
If the box “Testmode” is checked the whole Line flashes between all dots on and off.
To show the use of the driver the source code of this application is also delivered. (Borland C++Builder 4.0 projekt)

METEC AG · Hasenbergstr. 31 · 70178 STUTTGART · GERMANY
TELEFON:(07 11) 66 60 3-0 · TELEFAX:(07 11) 66 60 333 · E-MAIL:contact@metec-ag.de

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USB Functions of the Interface

1 Starting the Communication

First the Driver Handle has to be fetched.
This is done by calling CreateFile with the Driver Name (\\.\MITSUUSB0). If there is no USB-Braille Line connected the operating system do not activate the driver. In this case CreateFile delivers INVALID_HANDLE_VALUE as result.
If the driver delivers a valid Handle you have tho use this handle to communicate with the driver via the DeviceIoControl function.
Next you have to fetch the Device Info.
(For details see source code in funktion startClick.)

2 Reading the Device ID String

This string has to be read from the Interface to check whether the device works with this application.
To read the String a Vendor Request Nr 4 with 1 data byte of the value 0 is to be sent.
As reply the device starts a bulk read on pipe 0.
(For details see source code in funktion startClick.)

3 Switch on High Voltage

To switch on the High Voltage a Vendor Request Nr 1 with 1 data byte of the value 0xef is to be sent.

4 Setting the Length of the Braille Line

Because the modules are connected together in form of a shiftregister it is important to set the correct length of the Braille Line.
This is done by sending a vendor Request 0x40 with the length in the only one byte of data.

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USB Functions of the Interface

5 Sending the Braille Pattern

In the source code the Braille Pattern of a 80 character line sends via the USB Bus using a 10ms interrupt.
Every interrupt sends a block of 8 characters.
The function WrZeileMod(int Block) do this.
To do this a Vendor Request Nr 10+ BlockNr with the 8 byte data is to be sent.
Because the max. size of the Braille Line is 80 characters Vendor Requests 10 ..17 are possible.
For the relation between the characters and the Braille Pattern the included table “chrdef.c” is used.
To adapt the Braille Pattern to the Pin Order of the modules the function HardwareChange is used.
(For details see source code in funktion Timer1Timer, WrZeileMod and HardwareChange.)
Remember that it is important for proper function that the correct length of the line is set.

6 Reading the Cursor Position

The Cursor position can be readed by a vendor Request with the Number 0x80. The Requests returnes one Byte of date with the number of the pressed cursor key. The rear key comes with an offset of 100.
(For details see source code in funktion Timer1Timer.)
Remember that it is important for proper function that the correct length of the line is set.

Some additional information are coming when 8 bytes are read.
Byte 0 Routing keys
Byte 1 number of Modules (recognized by Firmware) (since Version 031215)
Byte 2 Additional Key Inputs (Bit 6=Key1, Bit 4= Key2, Bit 2=Key3)
(For 6Key Version: Bit 3=Key 4, Bit 1=Key5, Bit 0=Key6)

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