

Revision History

Version	Date	Notes	Author
1.0	20.08.2018	(IR) Initial Release	Pascal Hönisch

1. Introduction

This document describes the first steps to bring your Linde Bluetooth USB into operation. Please feel free to contact us under support@m2mgermany.de if you need any further information.

1.1. Functional Principle

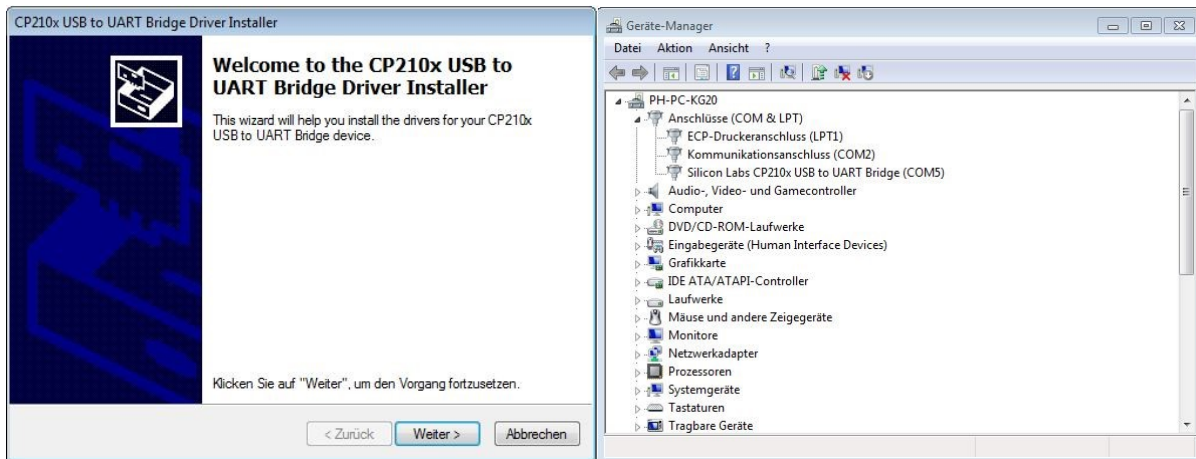
The Linde Bluetooth USB Stick is recognized as a standard USB serial device by your operating system. Microsoft Windows will add a new COM port and Linux-based systems will show the device as `/dev/ttyUSB*`. Thanks to the integrated Bluegiga iWRAP firmware you do not depend on the Bluetooth stack of your OS. Instead you can communicate to your Bluetooth devices directly over this virtual serial port.



2. Preparations

1.2. Windows Driver(s)

By default Windows will recognize the Linde Bluetooth USB Stick as **Silicon Labs CP210x USB to UART Bridge**. Please make sure to use the latest driver version which can be found under <https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>.



1.3. GNU/Linux Driver(s)

Most GNU/Linux distributions will already provide all required driver(s) in the standard installation which are implemented in the official Linux Kernel:

```
# cat /var/log/syslog
```

```
Aug 20 15:46:36 m2m-Ubuntu kernel: [23097.637172] usb 1-2: new full-speed USB device number 3
using xhci_hcd
Aug 20 15:46:36 m2m-Ubuntu kernel: [23097.982192] usb 1-2: New USB device found,
idVendor=10c4, idProduct=ea60
Aug 20 15:46:36 m2m-Ubuntu kernel: [23097.982194] usb 1-2: New USB device strings: Mfr=1,
Product=2, SerialNumber=3
Aug 20 15:46:36 m2m-Ubuntu kernel: [23097.982195] usb 1-2: Product: CP2102N USB to UART Bridge
Controller
Aug 20 15:46:36 m2m-Ubuntu kernel: [23097.982196] usb 1-2: Manufacturer: Silicon Labs
Aug 20 15:46:36 m2m-Ubuntu kernel: [23097.982197] usb 1-2: SerialNumber: 0001
Aug 20 15:46:37 m2m-Ubuntu kernel: [23098.039491] usbcore: registered new interface driver
usbserial_generic
Aug 20 15:46:37 m2m-Ubuntu kernel: [23098.039733] usbserial: USB Serial support registered for
generic
Aug 20 15:46:37 m2m-Ubuntu kernel: [23098.041626] usbcore: registered new interface driver
cp210x
Aug 20 15:46:37 m2m-Ubuntu kernel: [23098.041839] usbserial: USB Serial support registered for
cp210x
Aug 20 15:46:37 m2m-Ubuntu kernel: [23098.041894] cp210x 1-2:1.0: cp210x converter detected
Aug 20 15:46:37 m2m-Ubuntu kernel: [23098.047271] usb 1-2: cp210x converter now attached to
ttyUSB0
```

```
# lsmod | grep cp210x
```

```
cp210x          11238  0
usbserial      33357  1 cp210x
```

1.4. OEM Driver(s) options:

For special driver changes like OEM versions, please consult the [website](#) of the chip manufacturer **Silicon Labs**.

3. Getting Started

1.5. iWRAP Commands

Once the serial port is available in your system, you can connect the Linde Bluetooth USB Stick to it with a terminal program. Use the settings 115200@8N1 with RTS/CTS hardware flow control enabled. When re-attaching the Linde Bluetooth USB Stick it will show up with the following boot message:

```
INFO BOOT
WRAP THOR AI (5.7.0 build 1118)
Copyright (c) 2003-2017 Silicon Labs Inc.
```

Now you can use the iWRAP command set to request the Bluetooth functions. The full iWRAP reference manual with a description of all available commands can be found under <https://www.silabs.com/products/development-tools/software/bluegiga-iwrap-bluetooth-software-stack>.

1.6. iWRAP System Configuration

SET will show you a summary of the current configuration:

```
SET
SET BT BDADDR **:**:**:24:3d:00
SET BT NAME Linde Bluetooth USB Stick
SET BT CLASS 001f00
SET BT IDENT BT:47 f000 5.7.0 Bluegiga iWRAP
SET BT LAP 9e8b33
SET BT PAGEMODE 4 2000 1
SET BT POWER 18 18 18
SET BT ROLE 0 f 2580
SET BT SCO a 1 4d d 2 48
SET BT SNIFF 0 20 1 8
SET BT SSP 3 0
SET BT MTU 667
SET CONTROL BAUD 115200,8n1
SET CONTROL CD 00 0
SET CONTROL CONFIG 0000 0000 0000 11a1
SET CONTROL ECHO 7
SET CONTROL ESCAPE 43 00 1
SET CONTROL GAIN 0 5
SET CONTROL MSC DTE 00 00 00 00 00 00
SET CONTROL PIO 00 00 00
SET CONTROL READY 00
SET PROFILE SPP Bluetooth Serial Port
```

The INQUIRY command for example lists all visible Bluetooth devices in range:

```
INQUIRY 8 NAME
INQUIRY_PARTIAL **:**:**:3e:13:59 380104
INQUIRY_PARTIAL **:**:**:bd:70:19 0a010c
INQUIRY_PARTIAL **:**:**:0a:d9:bc 000000
INQUIRY_PARTIAL **:**:**:53:85:77 5a020c
INQUIRY_PARTIAL **:**:**:cb:68:c2 0c010c
INQUIRY_PARTIAL **:**:**:4a:a3:15 380104
INQUIRY_PARTIAL **:**:**:66:37:f5 7a220c
INQUIRY_PARTIAL **:**:**:57:da:60 380104
INQUIRY 8
INQUIRY **:**:**:3e:13:59 380104
INQUIRY **:**:**:bd:70:19 0a010c
INQUIRY **:**:**:0a:d9:bc 000000
INQUIRY **:**:**:53:85:77 5a020c
INQUIRY **:**:**:cb:68:c2 0c010c
INQUIRY **:**:**:4a:a3:15 380104
INQUIRY **:**:**:66:37:f5 7a220c
INQUIRY **:**:**:57:da:60 380104
NAME **:**:**:3e:13:59 "Device-1"
NAME **:**:**:bd:70:19 "Device-2"
NAME **:**:**:0a:d9:bc "Device-3"
NAME **:**:**:53:85:77 "Device-4"
NAME **:**:**:cb:68:c2 "Device-5"
NAME **:**:**:4a:a3:15 "Device-6"
```

4. Declaration of Conformity

Hereby, m2m Germany GmbH, declares that this BT Audio Adapter is in compliance with the essential requirements and other relevant provisions of the following Directives:

Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Directive 2011/65/eu of the european parliament and of the council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Commission Regulation (EC) No 278/2009 of 6 April 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies.

5. FCC and IC Declaration

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including

interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'appareil doit accepter tout brouillage radioélectrique subi,

même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by m2m Germany GmbH may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

6. Trademarks

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7. Contact Information

If you have any questions, issues or need technical advice, please do not hesitate to contact our team under:

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