

intertooth - The Bluetooth Console Cable

User Manual

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January 2023



Content

1 intertooth - The Bluetooth Console Cable	4
1.1 Properties	4
1.1.1 RJ45 Interface	4
1.1.2 USB-CDC Interface	5
1.1.3 D-SUB Interface	5
1.2 More Functions and Properties	5
2 Switch on and Connect to the End Device	7
2.1 Establishing the Bluetooth Connection for the First Time	7
2.1.1 Windows 10	7
2.1.2 Mac OS	10
3 Led Status Display	13
4 Configuration	14
4.1 Entering the Configuration Mode	14
4.2 View Information	14
4.3 Adjust the Configuration	15
4.3.1 Alarm	15
4.3.2 Serial Interface	16
4.3.3 Automatic on and off	17
4.3.4 System Settings	18

5 Interfaces	20
5.1 RJ45 Console Connector	20
5.2 RS232/D-SUB Interface	21
6 Contact	22
7 Declaration of Conformity	23
7.1 CE	23
7.2 FCC	23
7.2.1 FCC Compliance Statement	23
7.2.2 Supplier's Declaration of Conformity	24
7.3 Compliance Logos	24

1 intertooth - The Bluetooth Console Cable

The intertooth enables wireless access to serial interfaces via Bluetooth and has the following basic properties:

- Integrated battery
- Direct connection to RJ45 console ports
- Additional RS232 / D-SUB interface
- Bluetooth Class 1 for a range of up to 100 meters
- Universally compatible (Windows, Linux, Mac, iPhone, Android)

With the intertooth, you can conveniently configure your devices at the workplace and not in the noisy data center standing next to the rack. The intertooth is small, light and handy. When you connect the intertooth to the end device, it starts automatically and provides the interface via Bluetooth. Several intertooth can be connected to a PC at the same time without any problems, which is very convenient if you often work on several devices at the same time (e.g. when commissioning switch stacks).

No special drivers are required. After the Bluetooth coupling, the intertooth is automatically recognized and installed as a COM port on all platforms.

1.1 Properties

The intertooth has several interfaces for direct connection to various end devices and can be connected directly to RJ45, D-SUB and USB console ports.

1.1.1 RJ45 Interface

The supplied RJ45 cable enables connection to RJ45 console ports from Cisco, HP, NetApp and other manufacturers.



1.1.2 USB-CDC Interface

With the optional USB OTG cable, the intertooth can be used directly on USB console ports from Cisco and other manufacturers. The integrated battery is also charged via the same port. A standard USB charger can be used for this.



1.1.3 D-SUB Interface

The RS232 interface can also be used via the standardized D-SUB connector, enabling communication with any device that has an RS232 interface when using the appropriate cable for the respective device. The pin assignment is documented in the chapter RS232 / D-SUB interface.

1.2 More Functions and Properties

- Automatic switching on and off (see next chapter)
- Operating time of up to 15 hours and over 1000 hours of standby time
- Configurable acoustic and optical alarm (see chapter Alarm)

- LED status display (power, charge, connection) (see chapter LED status display)
- Battery replaceable by the user

2 Switch on and Connect to the End Device

The intertooth switches on automatically as soon as it is connected to an end device. If this is not the case, it could be for one of the following reasons:

- The device connected to the intertooth is not recognized. In this case the intertooth must be switched on manually.
- The data lines are interchanged in the connection cable used (RxD and TxD). A cable suitable for the connected device must be used.
- The battery is completely discharged.

To manually switch the intertooth on and off, press and hold the power button for three seconds. The power LED starts to light up continuously or flashes when the battery is weak. If the power button is mistakenly pressed for more than three seconds e.g. during transport, the intertooth will automatically switch off again after a configurable period of time.

2.1 Establishing the Bluetooth Connection for the First Time

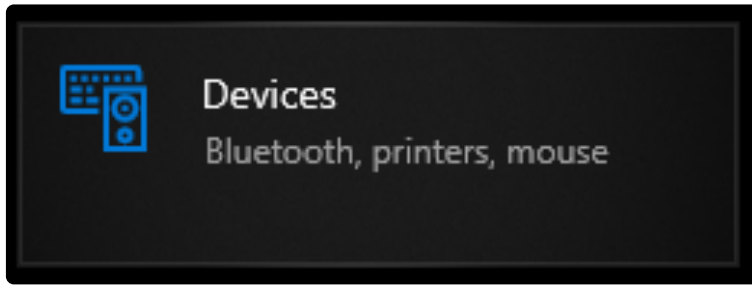
Switch on the intertooth and start the search for Bluetooth devices on your computer. The intertooth is recognized as "intertooth-NNNN", where NNNN stands for the last four characters of the MAC address. Please note that depending on the manufacturer, different software is used to manage Bluetooth connections. The following describes the procedure for connecting to the intertooth for Windows 10 and MacOS for the first time:

2.1.1 Windows 10

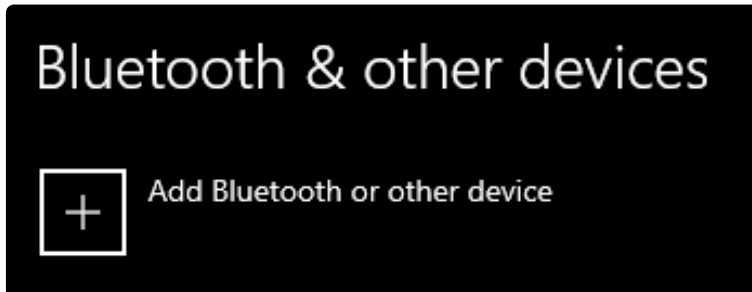
1. Add Bluetooth Device

If an intertooth is already connected to this PC, it will no longer be displayed as a new device. To reinstall a device that has already been paired, it must first be removed.

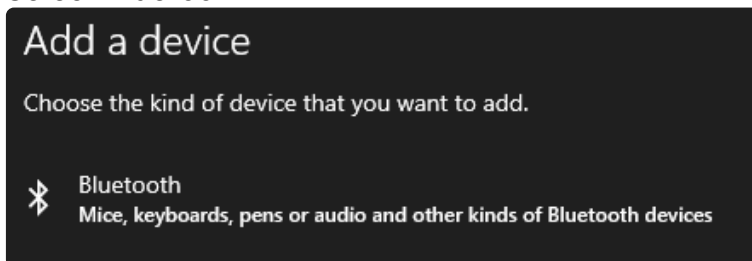
- Switch on the intertooth
- Press **Win** + **i** to open the settings
- Click on devices



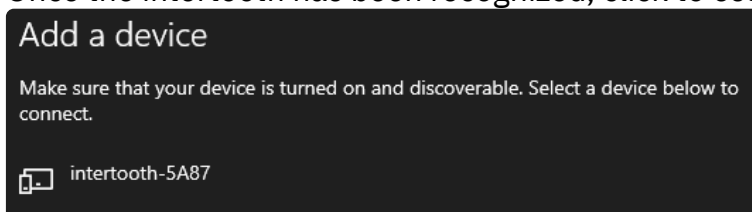
- Add Bluetooth or other device



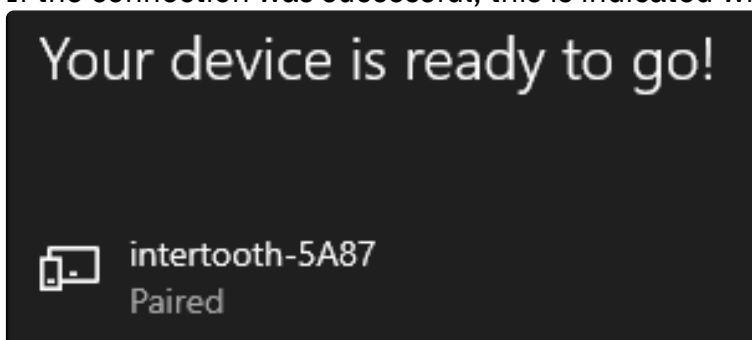
- Select Bluetooth



- Once the intertooth has been recognized, click to establish the connection



- If the connection was successful, this is indicated with the status Paired

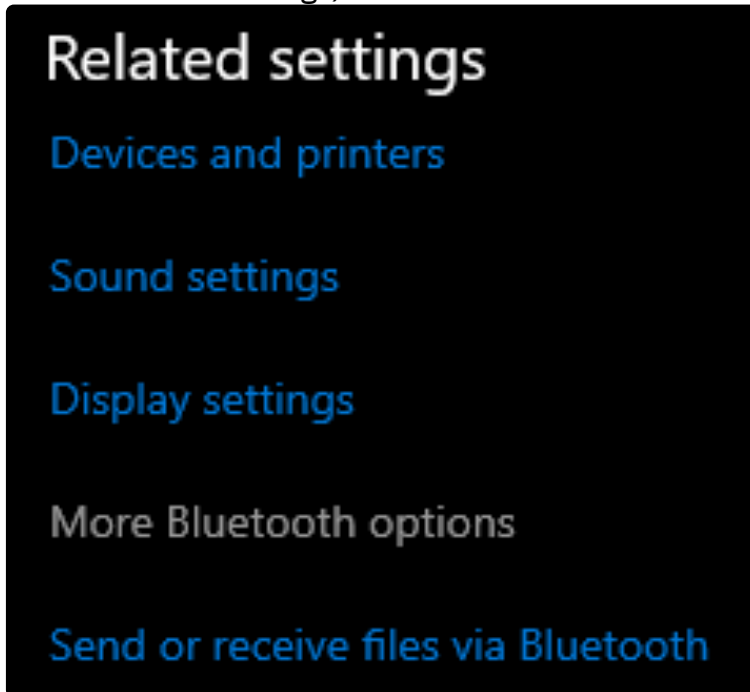


- Exit the wizard

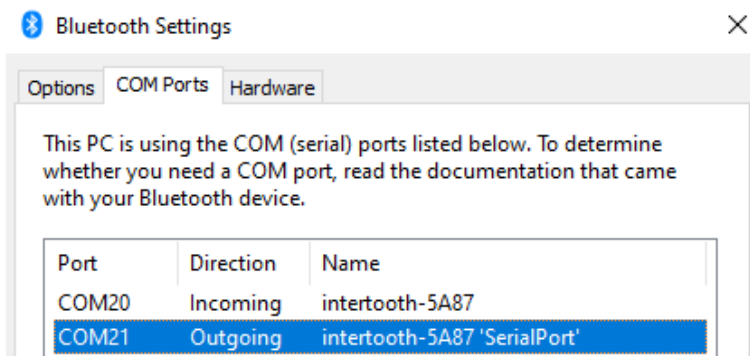
2. Show COM Port

The virtual COM port must be identified so that the serial interface can now be accessed with a terminal program. This process is only necessary once for each connected intertooth, as the COM port doesn't change.

- In the settings for Bluetooth and other devices (see above) click on More Bluetooth options (This is either at the bottom or on the right at the edge under Related Settings)



- Switch to the COM ports tab. Here two COM ports are displayed for each connected intertooth



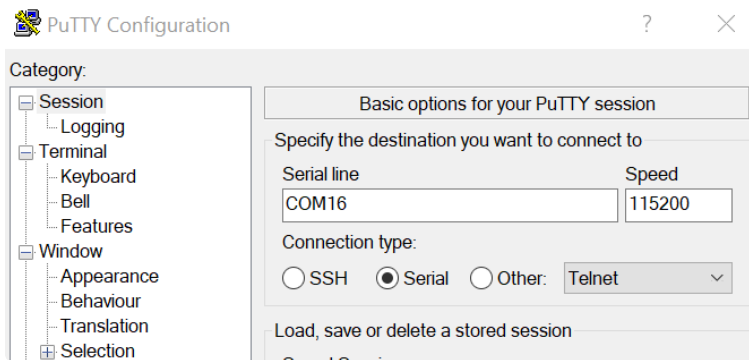
- To access the serial interface, the COM port with the direction Outgoing and the designation SerialPort must be used.

3. Connect Using PuTTY

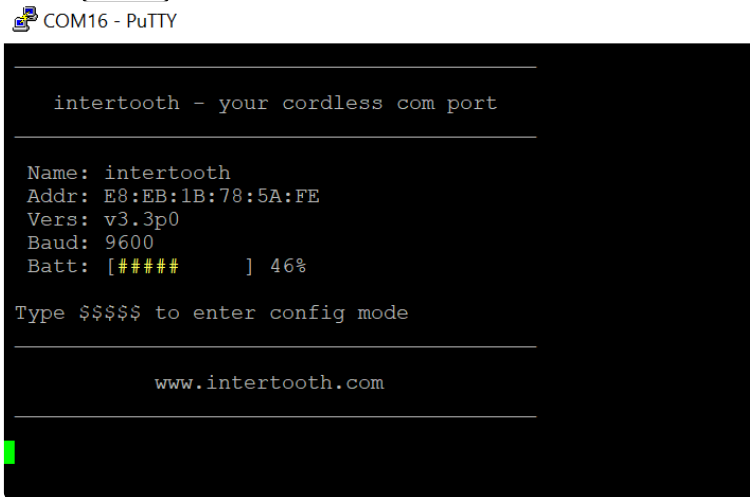
Establishing the connection is explained here using the example of PuTTY. However, any terminal program can be used.

- Start PuTTY
- Make settings as follows:
 - Connection Type: Serial

- Serial line: COMxx (Specify the previously identified COM port of the intertooth here)
- Speed: Not relevant, as the connection to the intertooth is via Bluetooth (the baud rate for the end device connected to the intertooth is set directly on the intertooth. See chapter `comport baudrate`)



- Click `Open` to establish the connection

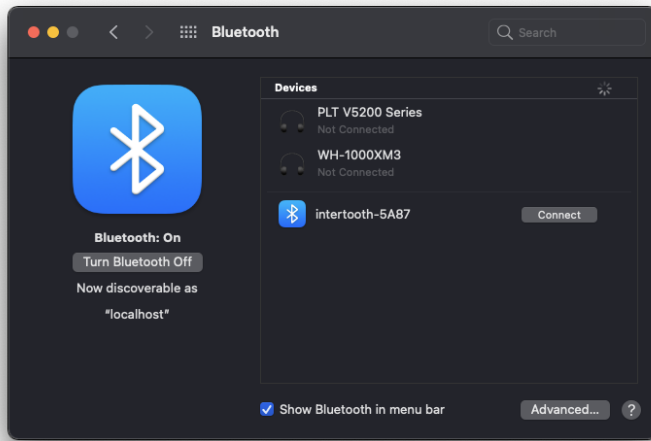


- After the connection has been established, the status message of the intertooth is displayed. The terminal device's console is then available.

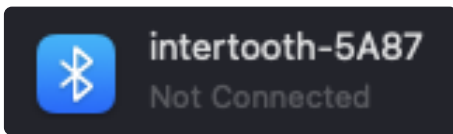
2.1.2 Mac OS

1. Add Bluetooth Device

- switch on the intertooth
- Open the system preferences and click on Bluetooth
- As soon as the intertooth is shown in the list, click on Connect



- After a short time the intertooth is shown as not connected, which is normal



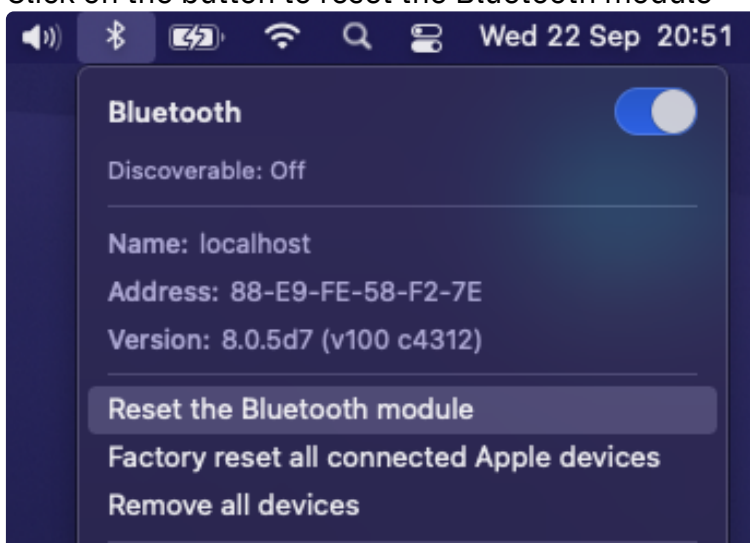
- If a connection cannot be established, it helps to delete the following file:

```
% ls -lah Library/Preferences/ByHost | grep Bluetooth
ber staff 340B 22 Sep 20:15 com.apple.Bluetooth.D0A3EA43-BAE6-53D1-A0D9-066A0EAEF154.plist
% rm Library/Preferences/ByHost/com.apple.Bluetooth.D0A3EA43-BAE6-53D1-A0D9-066A0EAEF154.plist
```

```
cd ~/Library/Preferences/ByHost
ls -lah | grep bluetooth
rm -f com.apple.Bluetooth[...].plist
```

If this does not help, the Mac Bluetooth module must be reset as follows:

- Hold down the **Shift** + **Option** keys and click on the Bluetooth symbol in the menu list at the top right
- Click on the button to reset the Bluetooth module



2. Show COM Port

The virtual COM port must be identified so that the serial interface can now be accessed with a terminal program. This process is only necessary once for each connected intertooth, as the COM port no longer changes.

- Click on the Launchpad icon in the Dock, enter Terminal in the search field and click on Terminal. The COM port can then be identified with the following command

```
ls -lah /dev | grep intertooth
```

```
% ls -lah /dev | grep intertooth
wheel      22,  7 22 Sep 20:15 cu.intertooth-5A87-SerialP
wheel      22,  6 22 Sep 20:15 tty.intertooth-5A87-SerialP
```

3. Connect Using screen

Establishing the connection is explained here using the example of `screen`. However, any terminal program can be used.

- After installing `screen`, you can use the following terminal command to establish a connection with the Intertooth

```
% screen /dev/tty.intertooth-5A87-SerialP
```

```
screen /dev/tty.intertooth-XXXX
```

- After the connection has been established, the status message of the intertooth is displayed. The terminal device's console is then available.

To detach or end the `screen` session, proceed as follows:

- To end the session: `Ctrl + a / k / y`
- To detach the session: `Ctrl + a / d`
- To reattach the session: `screen -r`

3 Led Status Display

The following table shows the meaning of the various LED displays:

power	charge	connection	Meaning
A	-	Off	Device ready, no Bluetooth connection established
A	-	A	Bluetooth connection established
A	-	Flashes	Bluetooth connection established and configuration mode active
Flashes	-	-	Battery weak
-	Flashes	-	Battery is charging
Flashes	Flashes	Flashes	Alarm

4 Configuration

The intertooth has various functions that can be adapted to personal needs. The configuration is carried out via the configuration mode, which can be called up at any time after connecting to the terminal application, even without a connected terminal device.

4.1 Entering the Configuration Mode

To access the configuration mode, press the `$` key 5 times. This is confirmed by the intertooth as follows:

```
Config-mode is active, press '?' for help.  
intertooth#
```

To exit configuration mode, enter `exit`. The settings made are saved automatically.

The configuration mode has an integrated help function. By entering `?`, information about the current command can be displayed at any time.

While entering a command, it can be completed by pressing `Tab`, provided the command is unique.

4.2 View Information

4.2.0.1 view battery

Displays the current charge status of the battery:

```
intertooth # view battery  
Battery: [#####] 52%
```

4.2.0.2 view config

Displays the entire current configuration. The commands are displayed in the same way as they can be used for the configuration.

```
intertooth#view config  
alarm delay 60  
alarm duration 20  
alarm enabled true  
alarm repeat true  
alarm volume 50
```

```
comport baudrate 9600
comport connect-alarm true
comport escape-replace true
power auto-off time 300
power auto-on alarm-time 1
system color default
system hostname intertooth
system led-brightness 100
template delay character 0
template delay line 100
template echo false
```

4.2.0.3 view version

Displays information about the software and hardware versions as well as the serial number / MAC address:

```
intertooth#view version
intertooth - your cordless com port
Firmware version: 3.3p0
PMC version: 1.4p0
Serial number / Bluetooth MAC address: E8:EB:1B:78:5A:FE
Hardware-Platform ID: 2
For more information, visit intertooth.com
```

4.3 Adjust the Configuration

The following describes how individual parameters can be adjusted and what they do.

4.3.1 Alarm

The alarm is to prevent the intertooth from being forgotten after use. After disconnecting the Bluetooth connection, an audible and visual alarm is triggered after a configurable period of time. The alarm lasts until the configurable duration has expired, the intertooth is switched off or the alarm is acknowledged by briefly pressing the power button.

4.3.1.1 alarm delay <time in seconds>

Time until the alarm is triggered after the connection has been disconnected.

Default setting: 60 seconds

4.3.1.2 alarm duration <time in seconds>

Duration of the alarm.

Default setting: 20 seconds

4.3.1.3 alarm enabled <true/false>

Activates or deactivates the alarm function. With 'false' the alarm function is completely deactivated.

Default setting: true

4.3.1.4 alarm repeat <true/false>

Repeat the alarm. With 'true' the alarm is triggered again after another `delay`.

Default setting: true

4.3.1.5 alarm test <time in seconds>

Function for testing the alarm. The alarm is activated for the specified length of time (helps to adjust the volume).

4.3.1.6 alarm volume <volume 0 - 100%>

Defines the volume of the alarm. It should be noted that the alarm can already be heard at a volume of 0%. To switch off the alarm completely, the command `alarm enabled false` is used.

Standard setting: 50%

4.3.2 Serial Interface

4.3.2.1 comport baudrate <baudrate in bps>

Defines the baud rate of the serial interface. Any baud rate in the range of 100 - 256000bps can be set. If a non-standardized baud rate is used, a corresponding message is displayed.

Standard setting: 9600bps

The currently configured baud rate is displayed when connecting:


```

intertooth - your cordless com port

Name: intertooth
Addr: E8:EB:1B:78:5A:FE
Ver: v3.3p0
Baud: 9600
Batt: [#####] 46%

Type $$$$ to enter config mode

www.intertooth.com

```

4.3.2.2 comport connect-alarm <true/false>

With 'true', a short alarm tone sounds when the serial interface is connected to a terminal device (the duration corresponds to that of the alarm during automatic switch-on (see power auto-on alarm-time)).

Default setting: true

4.3.2.3 comport escape-replace <true/false>

Activates or deactivates the break function.

Some devices use the break sequence (**CTRL** + **Break**) to get into a certain mode (e.g. `rommon>` at Cisco). Since the break sequence is not a normal ASCII character, it is not transmitted via the Bluetooth connection. When using the `comport escape-replace` function, which is activated by default, pressing the **Break** Key in the terminal application (not **CTRL** + **Break**) sends a break sequence (**CTRL** + **Break**) to the end device.

4.3.3 Automatic on and off

4.3.3.1 power auto-off time <time in seconds>

Time in seconds after which the intertooth automatically switches off as soon as the Bluetooth connection is disconnected.

Setting range: 0 - 3600 seconds, where 0 deactivates the function and the intertooth does not switch off automatically.

Default setting: 300 seconds (= 5 minutes)

4.3.3.2 power auto-on alarm-time <time in 1/10 seconds>

The intertooth switches on automatically when it is connected to an end device. A short alarm tone sounds so that there is no need to visually check whether the intertooth has recognized the connection and has switched itself on. This is also useful, for example, for devices that have several poorly accessible RJ45 ports, but only one of which is intended for the console. With this setting, the duration of this alarm can be adjusted, with 0 the function is deactivated.

Default setting: 1/10 second

4.3.4 System Settings

4.3.4.1 system color <color>

With this setting the color of the intertooth can be determined. The power LED and the text color take on the color according to this setting. This is particularly useful when several intertooths are used at the same time, in order to be able to easily distinguish the corresponding terminals. The text color is always yellow in configuration mode. In addition to the different colors, there are also the options 'default' and 'disable'.

The possible colors are:

- white white
- red red
- green green
- yellow yellow
- blue blue
- magenta pink
- cyan turquoise

Some terminals do not support the display of different colors. In addition, the colors are displayed differently depending on the terminal software.

- default LED color: green / text color: white / configuration mode: yellow / notes: green

- `disable` LED color: green / text color: no colors are used (for terminals that output the corresponding control characters instead of the colors)

Standard setting: default

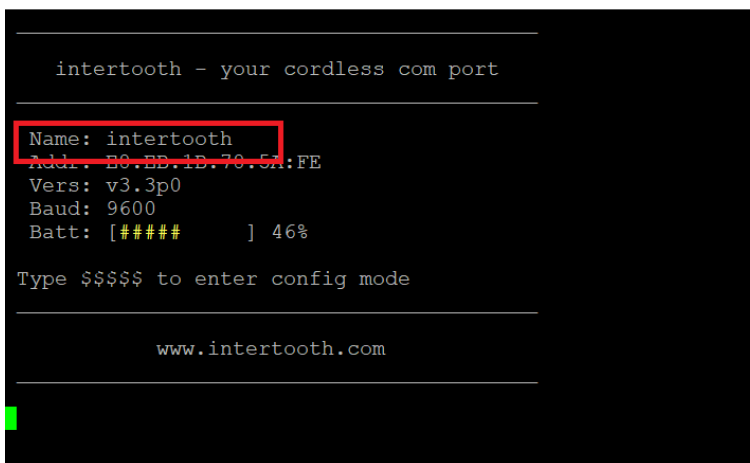
4.3.4.2 system hostname <name>

Name of the intertooth.

This setting makes it possible to give the intertooth a specific name. This is particularly useful when several intertooths are used at the same time in order to be able to differentiate between them.

The configured name is displayed in the status message:

COM16 - PuTTY



```
intertooth - your cordless com port
Name: intertooth
Add: 80,8D,1D,70,57:FE
Vers: v3.3p0
Baud: 9600
Batt: [##### ] 46%
Type $$$$ to enter config mode
www.intertooth.com
```

The maximum length of the name is 20 characters, and no spaces are possible.
Standard setting: intertooth

4.3.4.3 system led-brightness <brightness 1 ... 100%>

Defines the brightness of the LEDs. The minimum brightness of 1% is set in such a way that the LEDs also shine visibly.

5 Interfaces

5.1 RJ45 Console Connector

The RJ45 interface can be connected directly to the console port of many devices with the supplied RJ45 patch cable. If the connection does not work, a different pin assignment may be used.

The pin assignment when using the supplied cable (patch cable) is as follows:

Pin	Function
1	Not used
2	Not used
3	RXD
4	GND
5	GND
6	TXD
7	Not used
8	Not used

The function of the supplied cable has been successfully tested on the following devices with an RJ45 console port:

Manufacturer	Device type	Note
Cisco	All	
3Com	All	Baud rate 19'200
HP	All	
Avaya / Nortel	All with RJ45 console	Press Ctrl + y to activate the console

Alcatel switches use an RJ45 plug for the console connection, but this has a different pin assignment. Therefore, the original Alcatel cable with the D-SUB connection on the intertooth must be used for these devices.

5.2 RS232/D-SUB Interface

The RS232/D-SUB interface can be used universally, the pin assignment corresponds to that of the serial interface of a PC, whereby only the RxD, TxD and GND pins are connected, since the other pins are not required for console access.

Pin	Function
1	Not used
2	RXD
3	TXD
4	Not used
5	GND
6	Not used
7	Not used
8	Not used
9	Not used

6 Contact

Current information about the intertooth can be found at www.intertooth.com

You can reach us at info@intertooth.com

7 Declaration of Conformity

7.1 CE

You can find the Declaration of Conformity valid for the European Union under the following link:

https://www.intertooth.com/en/info/manual/_manual-content/intertooth-ce-declaration-of-conformity.pdf

7.2 FCC

7.2.1 FCC Compliance Statement

Contains FCC ID: A8TBM78ABCDEFGH

CAUTION: The manufacturer is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. 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.

NOTE: 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.

7.2.2 Supplier's Declaration of Conformity

47 CFR § 2.1077 Compliance Information

Product Name: intertooth

Product Model: intertooth

Manufacturer:

Two Wave Technologies GmbH Werkstrasse 26 3084 Wabern, Bern,
Switzerland info@intertooth.com www.intertooth.com

Modular Components Used:

NAME: Bluetooth Module MODEL: RN4678 FCC ID: A8TBM78ABCDEFGH This device complies with part 15 of the FCC Rules. 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.

7.3 Compliance Logos

