Relay-Board-RDP
Bluetooth and WIFI

Document:

Document:	Relay-Board-RDP Bluetooth and WIFI	Document Content: User guide for the Bluetooth and WIFI interface.
Version:	V002	
Author:	MIZ	
Date:	2020.07.06	
Release-State:	Approved	Pages: 12

Table of Contents

Revision History:

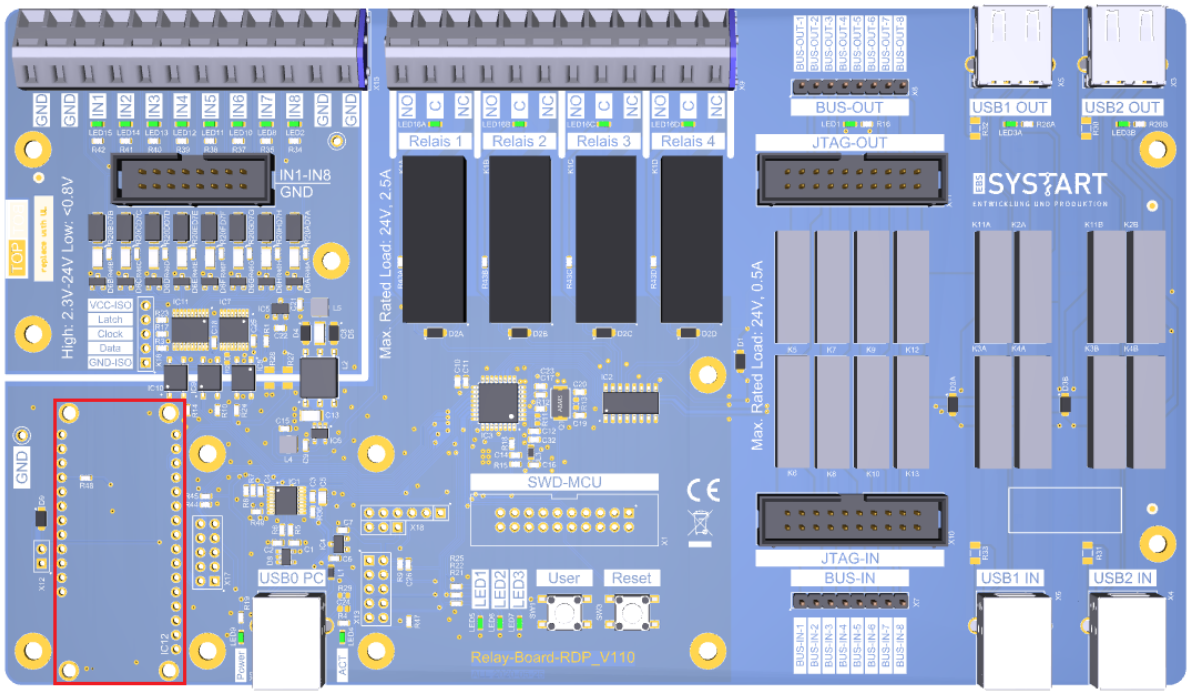
Rev.:	Date:	Name:	Change:
001	09.06.2020	MIZ	Initial Version
002	18.06.2020	MIZ	Relay Board RDP Control Tool with Bluetooth

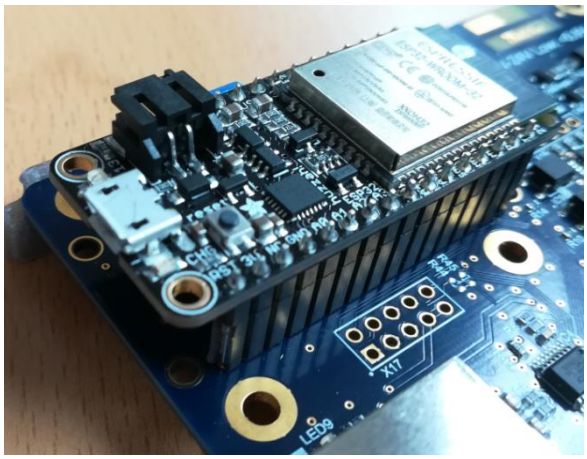
1. Needed Hardware

- Relay-Board-RDP_V110
- USB-B-Cable for power supply of the Relay-Board
- Adafruit HUZZAH32 – ESP32 FEATHER BOARD (Product ID: 3405)
- USB-Micro-B-Cable for programming of the Adafruit board
- PC with bluetooth support

2. Relay-Board-RDP_V110 with Adafruit HUZZAH32-Board

A Huzzah32-Boad will be mounted on the Relay-Board to make the control of the Relay-Boad via bluetooth or wifi possible. Therefor you need to place it in the provided holes and solder it to the holes of the IC12 connector. Alternatively you can solder two socket connectors to the holes of IC12 and plug the HUZZAH32-Board into them. The HUZZAH32-Board will be supplied directly through the 5 Volt of the USB0 PC connector of the Relay-Board.





3. Flashing of the Adafruit HUZZAH32

First a Demo-program for controlling the Relay-Boad via the serial bluetooth or the wifi interface will be flashed on the HUZZAH32-Boad. Therefor the following software is needed.

3.1 Needed Software

The arduino IDE will be used to flash the Demo-program. It can be downloaded for free at the following link (*Windows Installer, for Windwos 7 and up*):

- https://www.arduino.cc/en/main/software

The USB-Driver for the CP210x USB to UART Bridge of Silicon Labs can be downloaded at the following link (*Windows 10 Universal → Download VCP*), if Windows doesn't recognize the HUZZAH32-Boad:

- https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers

The IDE, as well as the USB-Driver need to be installed to flash the HUZZAH32-Boad.

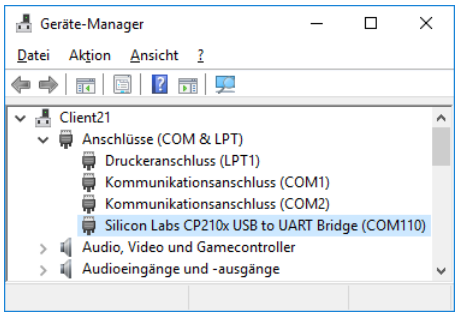
The Code for the Demo-Programm can be downloaded at the EBS-SYSTART-Homepage. It is located in the *Relay-Board-RDP_BT-Demo_V100.ino* or *Relay-Board-RDP_WLAN-Demo_V100.ino* file.

- https://www.ebs-systart.com/relais-board

3.2 Setup of the Arduino IDE

To upload a program with the Arduino IDE to the HUZZAH32, the assigned COM-Port will be looked up first in the Device-Manager. Connect the HUZZAH32-Board to the PC (the USB-Driver needs to be installed).

- Windows-Key + X → Device-Manager
- In this case, the COM-Port *COM110* is assigned to the HUZZAH32



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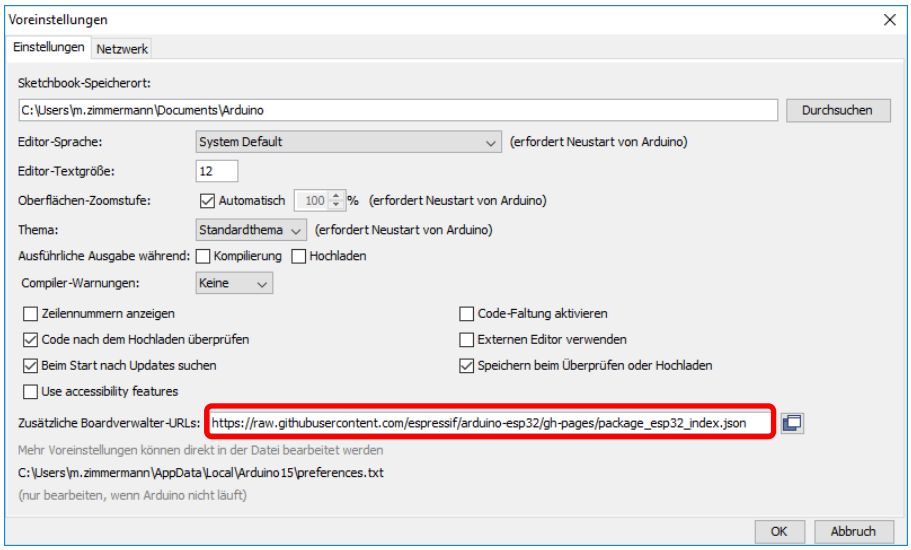
In the next step, the HUZZAH-Board will be added to the Arduino IDE. Start the IDE by clicking on arduino.exe.

Under the tab *File → Preferences* the HUZZAH32-Board will be added to the Arduino IDE. Copy the following link into the the field *Additional Boad Manager URLs*:

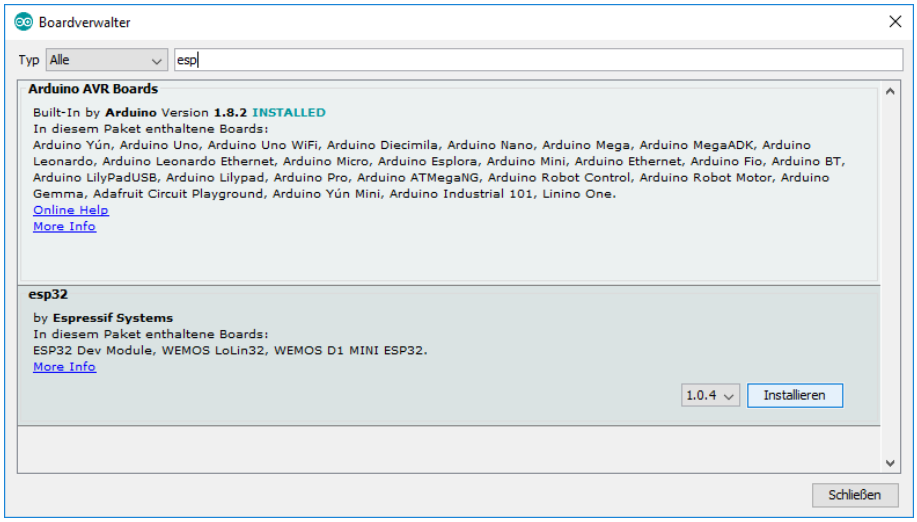
- `https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json`



Click then on the button OK.

The HUZZAH32-Board can now be added in the *Boards Manager*:

- *Tools* → *Board: ...* → *Boards Manager...* → search for *esp*



Click on the button *Install* and close the *Boads Manager* afterwards.

Choose *Adafruit ESP32 Feather* under the tab *Tools* → *Boad: ....* . *Upload Speed* should be set to 921600 and *Flash Frequency* to 80 MHz. The Port will be set to the previously identified COM-Port (section 3.2).

Additional information about the HUZZAH32 setup can be found at the Adafruit-Homepage:

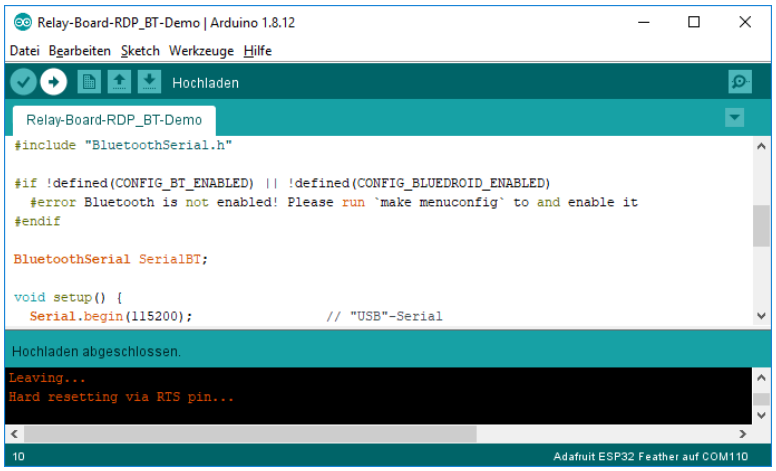
- https://learn.adafruit.com/adafruit-huzzah32-esp32-feather

3.3 Flashing of the Adafruit HUZZAH32

Load the code of the Demo-Program into the Arduino-IDE:

- File → Open → *Relay-Board-RDP_BT-Demo_V100.ino* (Bluetooth-Demo)
- File → Open → *Relay-Board-RDP_WLAN-Demo_V100.ino* (Wifi-Demo)

The code will be compiled and uploaded to the HUZZAH32 by clicking on the Upload button.



After the successful upload of the desired Demo-Programm, the HUZZAH32 is ready for use.

4. Controlling the Relay-Board via Bluetooth (GUI)

The bluetooth control can be achieved with the *Relay Board Control Tool* or with an arbitrary serial communication program (section 5). This section will show the control with the SYSTART-Tool.

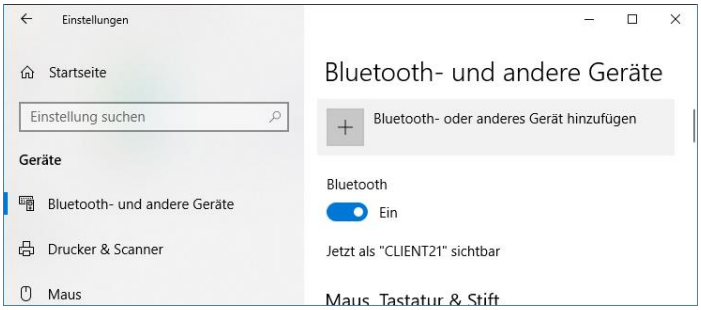
4.1 Needed Software

- HUZZAH32 with flashed Bluetooth-Demo (section 3.3)
- *Relay Board RDP Control Tool*
  - https://www.ebs-systart.com/relais-board

4.2 Connect PC with HUZZAH32

First a connection between the HUZZAH32 and the PC will be established:

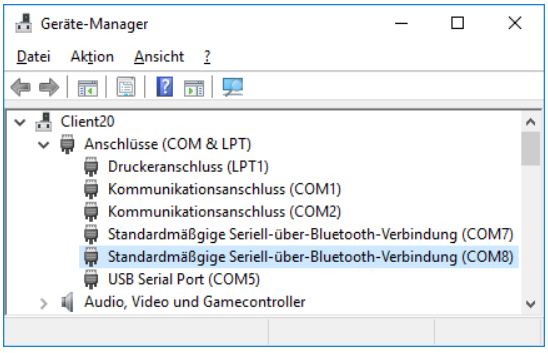
- Windows-Key + X → Control Panel → Devices → Bluetooth & other devices
- Add Bluetooth or other device → Bluetooth → Relay-Board-RDP
- As soon as the Relay-Board is paired, the PC is able to communicate with it.



4.3 Identify the assigned COM-Port

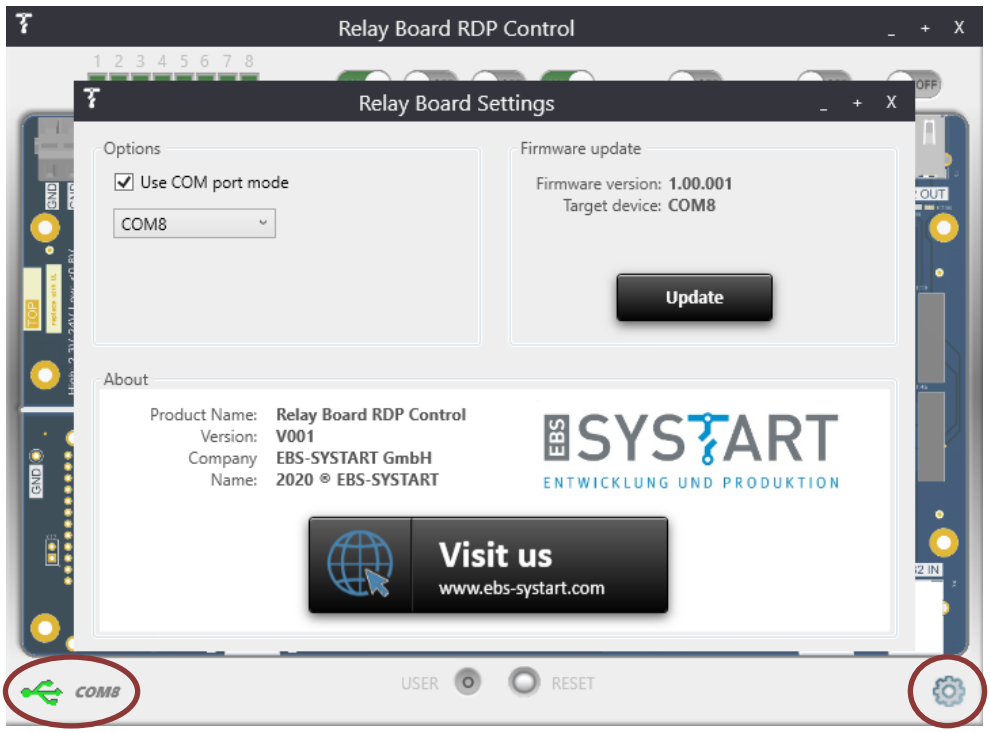
As soon as the HUZZAH32 is connected to the PC via Bluetooth, it will be displayed as a serial COM-Port. The assigned COM-Port can be looked up in the Device-Manager. If there is more than one with the exact same name, the corresponding COM-Ports need to be tried in the Control-Tool.

- Windows-Key + X → Device-Manager
- In this case, the serial Bluetooth-connection is at *COM8*

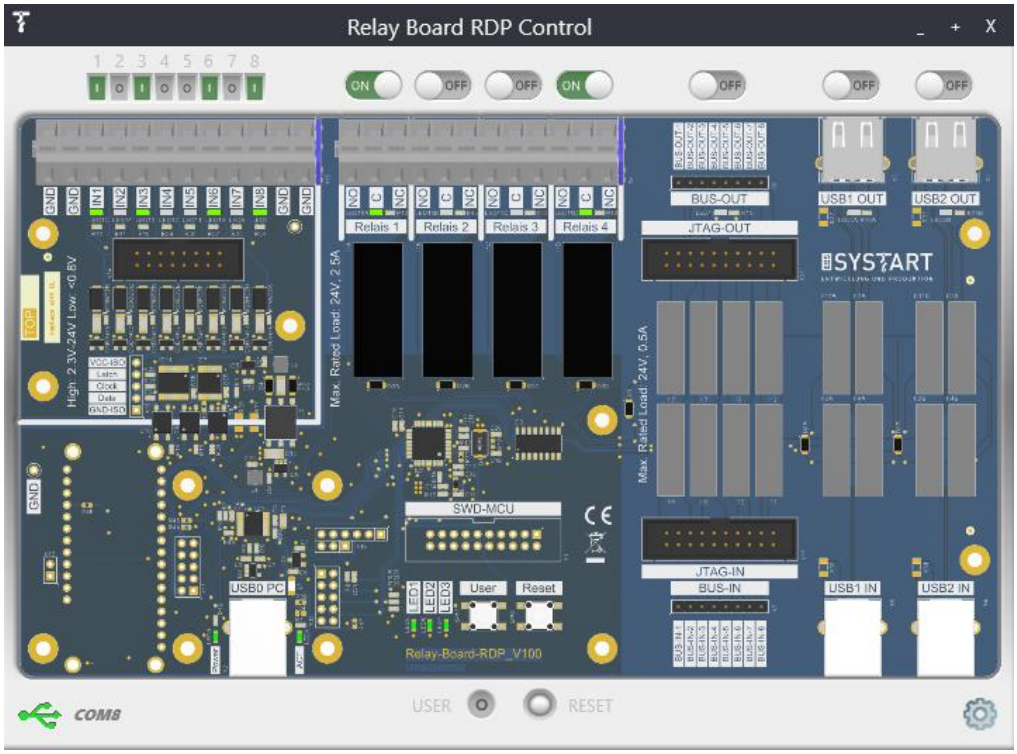


4.4 Controlling the Relay-Board

Start the *Relay Board RDP Control Tool*. Beside the USB-Port, an alternative COM-Port can be set under settings (gearwheel symbol on the low right). Choose the previously identified Port.



Close the settings by clicking on the X. If establishing a connection was successful, a green USB-Symbol will be displayed at the lower left corner. The Inputs will now be automatically updated. Furthermore the relays can now be toggled by clicking on the slide control above the corresponding output.



5. Controlling the Relay-Board via Bluetooth (Console)

The Relay-Board can also be controlled by a communication program like HTerm. A serial interface is used to communicate with the Relay-Board. Therefore another arbitrary serial communication program can be used as well.

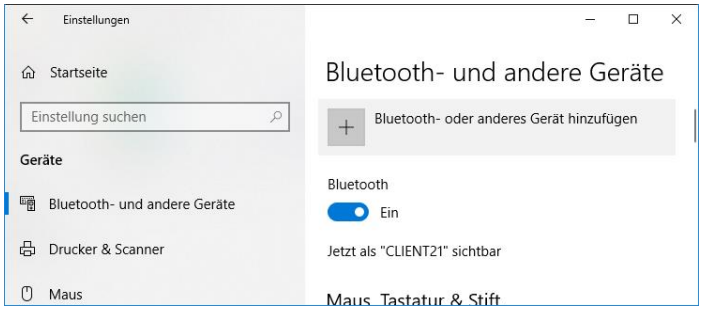
5.1 Needed Software

- HUZZAH32 with flashed Bluetooth-Demo (section 3.3)
- HTerm (Download for Windows):
  - http://der-hammer.info/pages/terminal.html
- HTerm-Command-File (*hterm_commands_V100.hts*):
  - https://www.ebs-systart.com/relais-board

5.2 Connect PC with HUZZAH32

First a connection between the HUZZAH32 and the PC will be established:

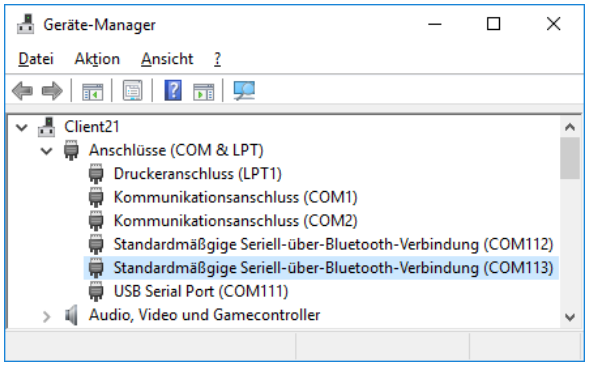
- Windows-Key + X → Control Panel → Devices → Bluetooth & other devices
- Add Bluetooth or other device → Bluetooth → Relay-Board-RDP
- As soon as the Relay-Board is paired, the PC is able to communicate with it.



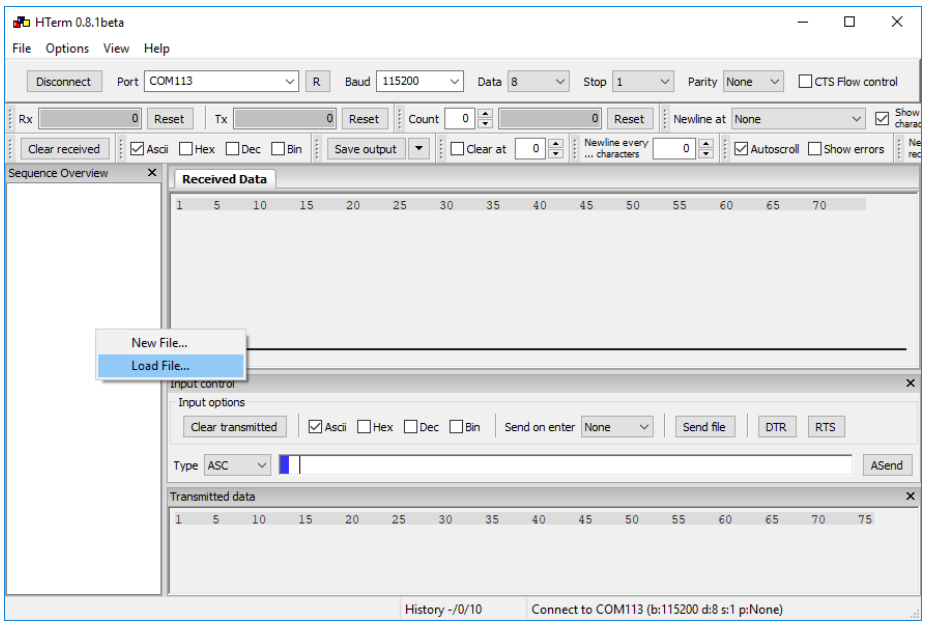
5.3 Setup HTerm

As soon as the HUZZAH32 is connected to the PC via bluetooth, it will be displayed as serial COM-Port. The assigned COM-Port can again be looked up in the Device-Manager. If there is more than one with the exact same name, the corresponding COM-Ports need to be tried in HTerm.

- Windows-Key + X Device-Manager
- In this case, the serial Bluetooth-connection is at *COM113*



Open HTerm and choose the corresponding Port. Click at Connect.

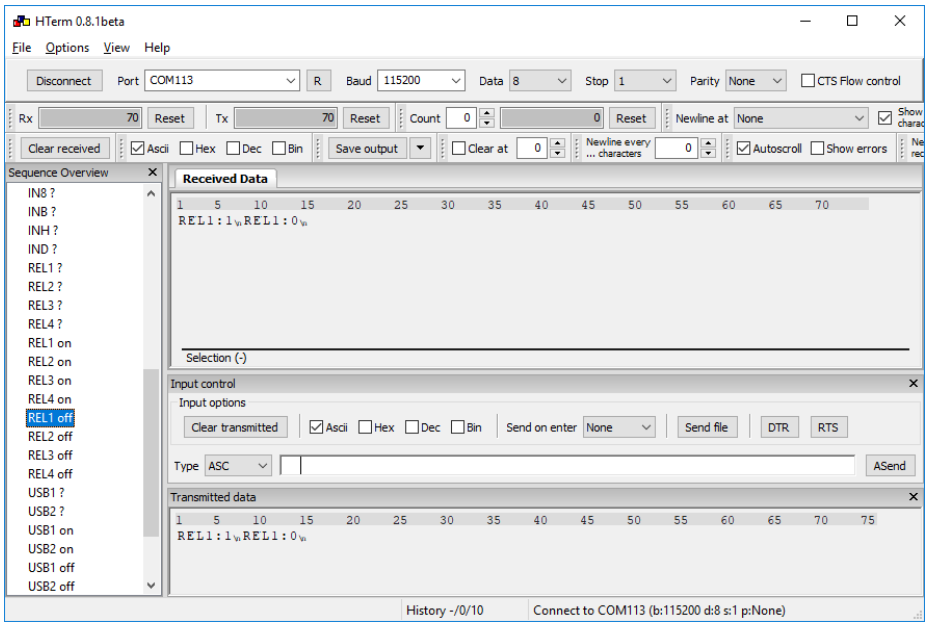


Now load the command list into HTerm:

- Right-click in the *Sequence Overview* field →Load File → *hterm_commands_V100.hts*

5.4 Send Commands

By double-clicking on the desired item, the corresponding command will be transmitted to the Relay Board and executed.



6. Controlling the Relay-Board via Wifi

The control via Wifi will be exemplary shown by using a web browser. Therefor the Wifi Demo-program will be flashed on the HUZZAH32-Board. With the Wifi-demo it works as a Webserver, which can be accessed by entering the IP-address in a web browser. The Relay-Board can be controlled by clicking on the corresponding link on the website.

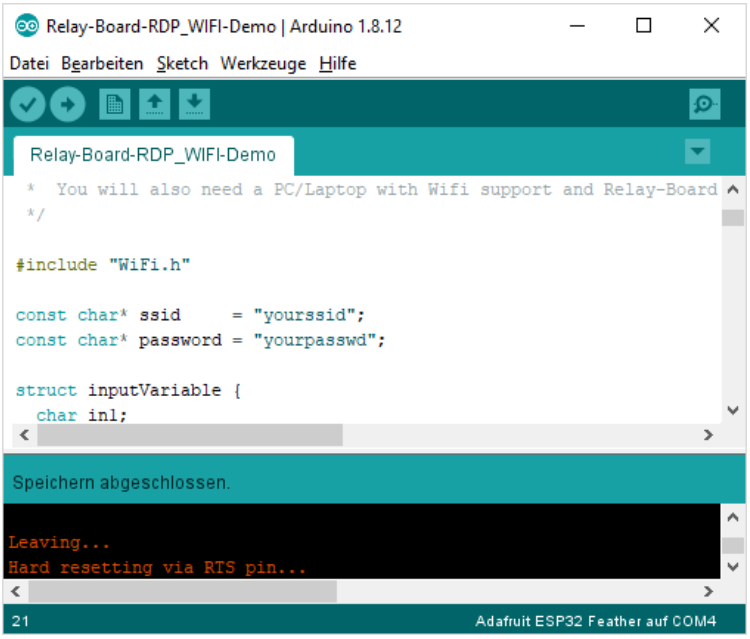
6.1 Needed Software

- HUZZAH32 with flashed Wifi-Demo (section 3.3)
- Web browser
- HTerm (Download for Windows):
  - http://der-hammer.info/pages/terminal.html

6.2 Connect to Wifi-Router

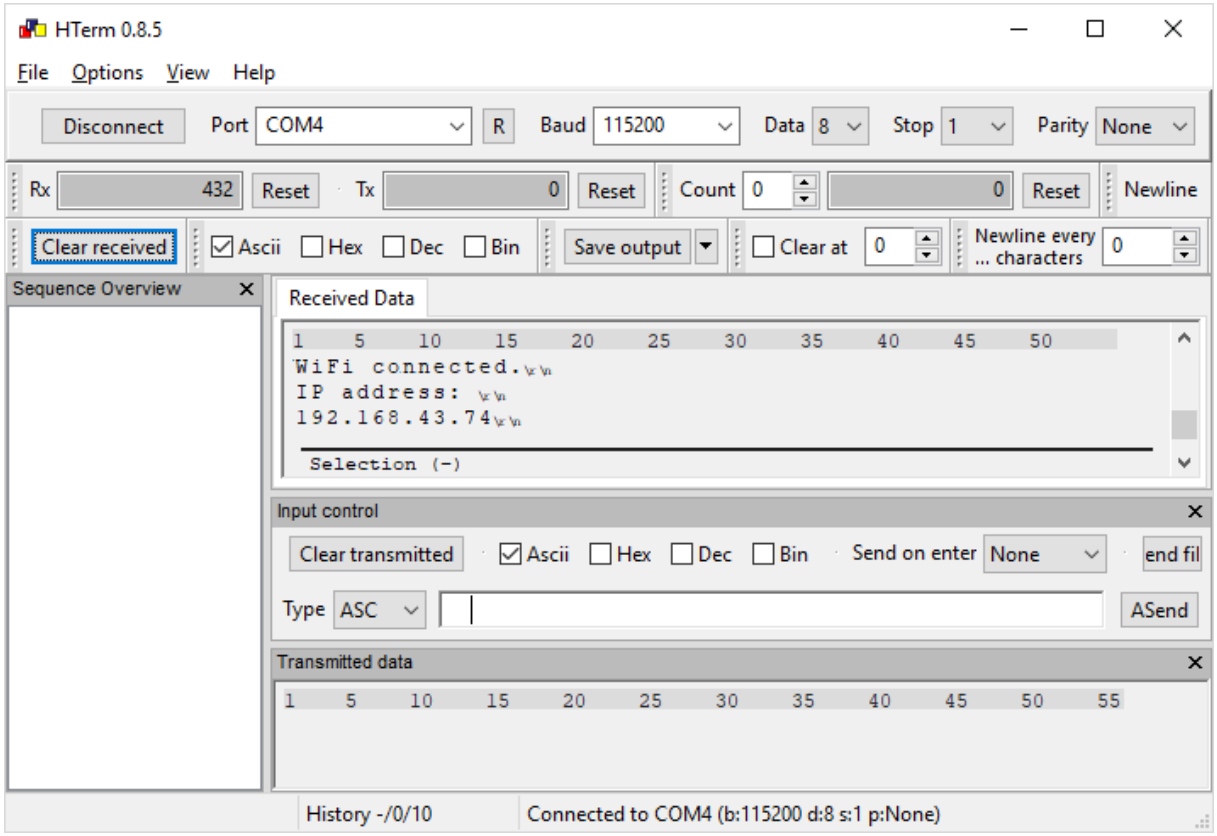
The access data for the Wifi-Router is stored in the code of the Wifi-Demo. Accordingly the SSID and the password need to be inserted into the code. Replace yourssid and yourpasswd in the code with your specific access data.

- const char* ssid = "yourssid";
- const char* password = "yourpasswd";



After the code is successfully uploaded (section 3.3), the HUZZAH32 automatically connects to the Wifi-Router and outputs its IP-address via USB-Interface. The IP-address can be received by a communication program like HTerm.

Connect HTerm with the COM-Port of the HUZZAH32 and reset the HUZZAH32 by pressing the reset button. As soon as the connection to the Wifi-Router is established, the IP-Adress of the webserver will be displayed in the “Received Data” window.



6.3 Control the Relay-Board

The webserver of the HUZZAH32 can be accessed by entering the previously listed IP-address in a web browser. The desired commands will be transmitted to the Relay-Board by clicking on the corresponding link.