Wyrdoscope Hardware User Manual

Date	Version	Author	Change
3.12.2023	0.1	Wolfhardt Janu	Initial Version

Wyrdoscope Software User Manual

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1. Controlling the Wyrdoscope

1.1   License

The Wyrdoscope Controlling Software is open Source and runs under the GNU Public license.

In case of further questions , please contact Wyrd Technologies.

2. Terminology

Term	Description
Alice, Bob	Names of the two random event generators (REG)
REG	Random Event Generator
Bitrate	How many bits per second the random event generator delivers (default: 200)
Raw Data Files	Files copied over from the hardware. These are the outputs of the REGs and usually are named Alice_<date>_<time>.csv and Bob_<date>_<time>.csv

3. Usage of the Wyrdoscope

The Wyrdoscope records the data of two Random Event Generators (REG's) and facilitates the collection of meta data with an event and an audio button.

Inside the Wyrdoscope two TrueRNG Pro REG's are used to synchronously generate random data. One REG is named Alice the other one Bob. Each second per default 200 Random Bits are taken from each REG device. The software is using the maximum time precision possible to capture the data at the same time. The data of both REG's are saved in seperate csv (comma separated value) files called Raw Data Files.

A Raw Data File contains five columns: UTC Unix timestamp, the duration in seconds, the REG bitstream, the REG bitsum and a comment column used to mark events and start and stop times of audio recordings. The naming convention of the files "Alice_ or Bob_ Year-month-day" allows you to conveniently find raw data files of a specific day.
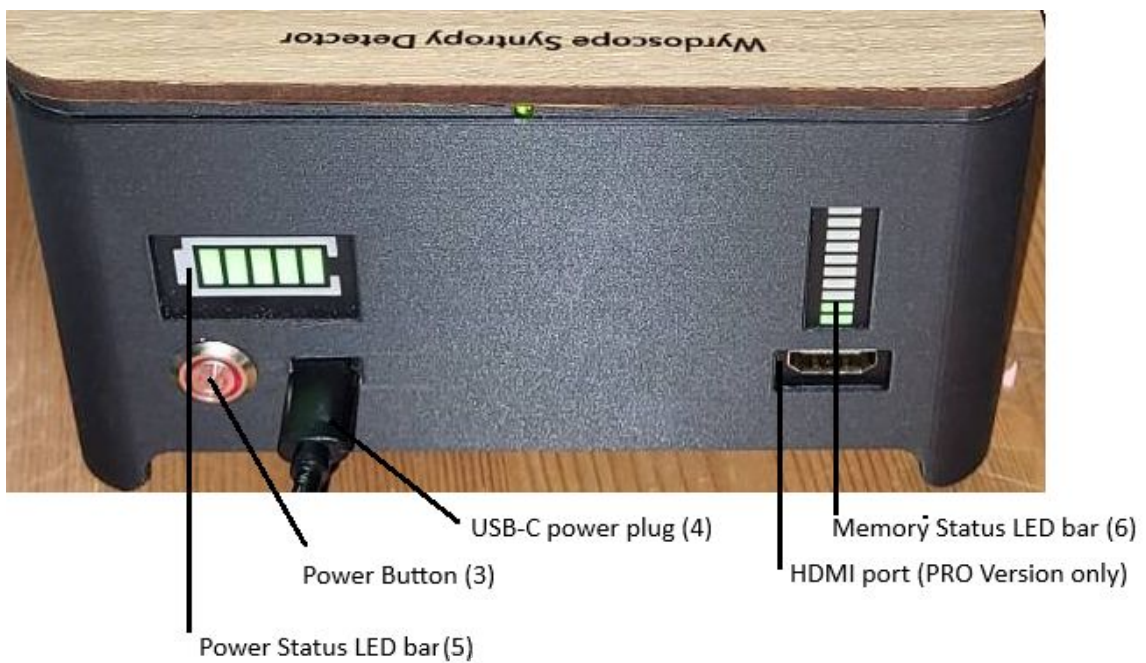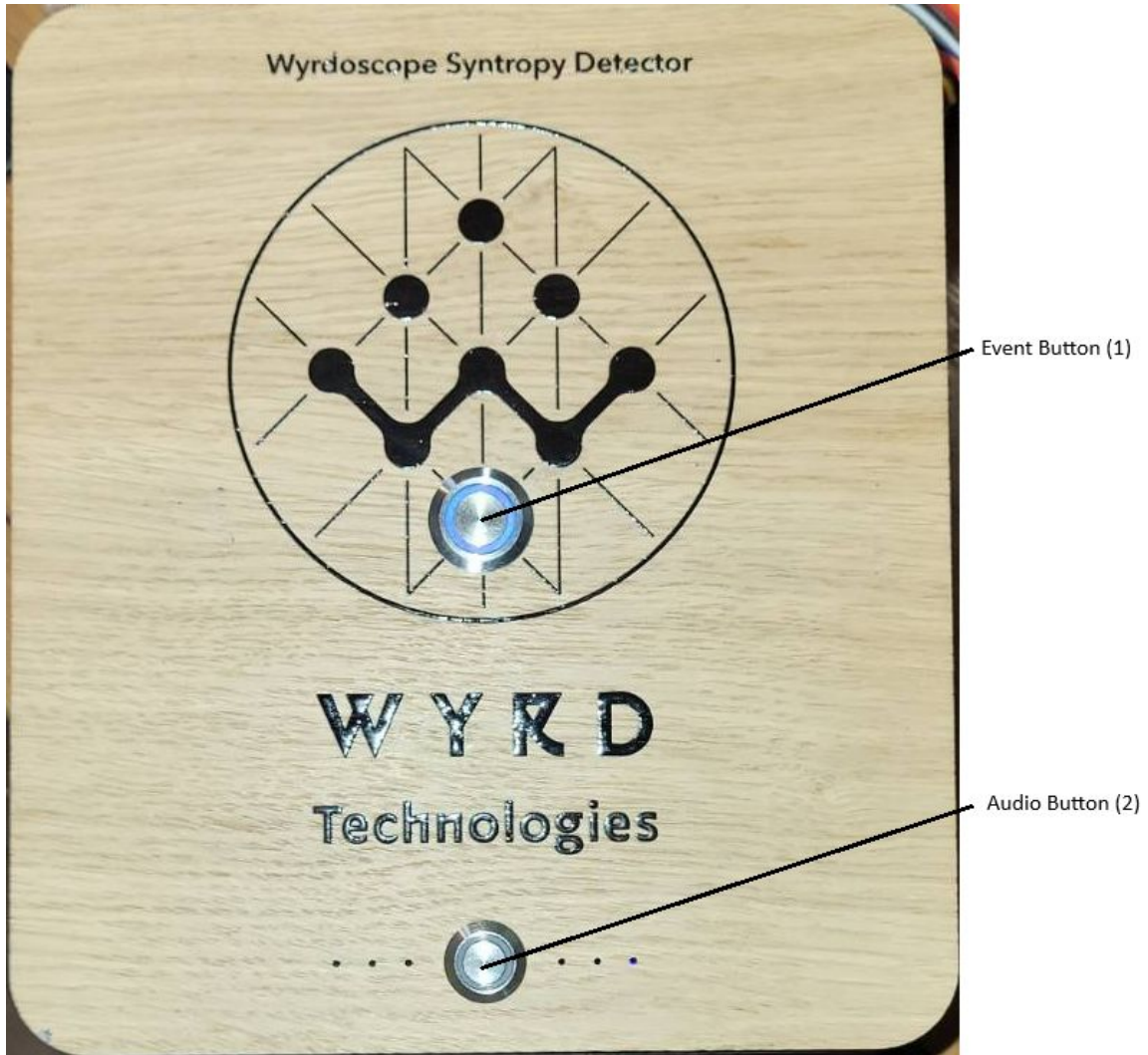
If the Wyrdoscope is switched on and off on the same day more than once, then at the end of the filename "_1", "_1_2", "1_2_3", etc is added.

A similar naming convention is used for generating audio files.

Renaming raw data or audio files is not recommended as it might impact further data analysis with our analysis software.

The Raw data files are stored in the "/data" folder, the audio files in the "/data/AudioRecordings" folder.

3. Usage of the Wyrdoscope

Event Button (1)

Audio Button (2)

USB-C power plug (4)

Power Button (3)

Power Status LED bar (5)

Memory Status LED bar (6)

HDMI port (PRO Version only)

3.1 Buttons

3.1.1 The Event Button

As soon as the Wyrdoscope has finshed booting (which takes c. 1 min) the LED of the Event Button is switched on.

The event button (1) serves to mark events during a recording. If you press it a numerical event is saved to the Alice and Bob Raw data files. These events will show up as event1, event2, etc. in the analysis software.

If you hold the Event button down for longer than 3 seconds the Wyrdoscope switches into Standby mode.

As soon as the Wyrdoscope is in Standby the LED of the Event Button is switched off.

If in Standby mode a short press on the Event button restarts the Wyrdoscope.

3.1.2 The Audio Button

The LED of the Audio Button (2) is only switched on during an active audio recording.

To start an audio recording press briefly the Audio Button (Audio Button LED is switched on). To stop it press the Audio Button again (Audio Button LED is switched off).

The audio is recorded by the inbuilt microphone. To save space on the SD card the audio files are stored as mp3 files.

3.1.3 The Power Button

The LED of the Power button (3) lights up when the Wyrdoscope is switched on and the battery charge is above 3%. Note that there is approximately one minute between switching on the Wyprdoscope (Power button LED lights up) and the Wyrdoscope switching into recording mode (Battery and Memory LED's light up).

3.1 Buttons

3.2 The battery LED

The battery LED shows the battery status. Each LED segment represents 20% of the battery capacity. If the Wyrdoscope is connected to the grid and the battery is charging then the segements flash on and off up until the segment showing the current charging. Once the battery is fully charged the flashing stops.

Note that when the battery charge goes below 5% the Wyrdoscope is switched into standby mode to guarantee a safe shutdown.

3.3 The memory LED

The memory LED shows the amount of memory that has been taken up on the SD card. Each segment represents 10% of the SD card memory.

The last two segments are coloured yellow and red. When the yellow segment is reached, please move the data from the Wyrdoscope to an external computer to avoid the SD card running out of space and you missing any recording data..

4. Accessing the Wyrdoscope Data

4.1 Data Access Interface

The Wyrdoscope has a simple Samba file server interface to access the REG Raw data and audio files via an external computer. Additionally, it offers full access to the Wyrdoscope desktop including the controlling software and the file structure via a Virtual Network Client (VNC). The Pro version additionally allows you to plug in a keyboard, mouse and HDMI monitor to use it as a full computer. Beside the HDMI port, the Pro version provides four USB 3.0 ports on the front side (not shown) to connect additional devices. To connect via Samba or VNC client the Wyrdoscope provides WLAN access. Search in your available networks list and connect with the "Wyrdoscope" WLAN network. Enter the WLAN password you received in a separate file when you purchased your Wyrdoscope.
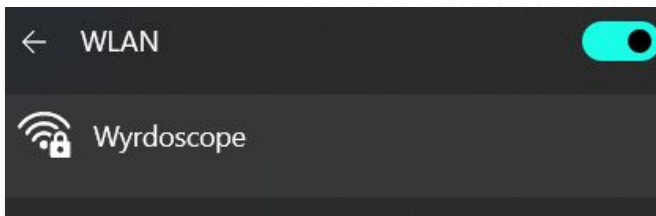

Figure 2 Wyrdoscope WLAN.

4.2 Access the data folder on Windows, Mac and Linux

Enter "\\192.168.0.1" (do not forget the "\\" !) in the browser address bar. When doing this for the first time, a login screen will pop up. Enter username "wyrdo" and the user password provided to you when you purchased your Wyrdoscope (figure 3a) . Save your settings for future access. After logging in you will see in your network folder an entry "192.168.0.1", which shows three folders: "wyrdo", "Wyrdoscope_controlling software" and "Wyrdoscope_data" (Figure 3b).
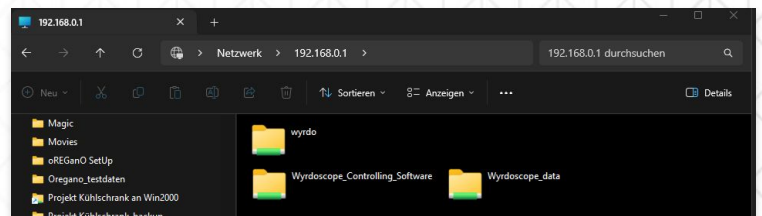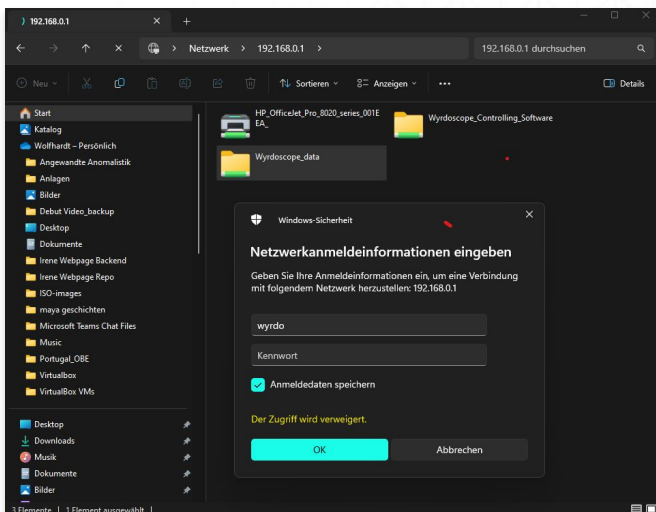

Figure 3a (left) shows the login screen of the Windows Explorer when logging in the first time.

Figure 3b (right) shows the three Wyrdoscope folders after logging in.

The "wyrdo" folder is read-only and provides an overview of the complete folder structure on the Wyrdoscope.

4. Accessing the Wyrdoscope Data

The "Wyrdoscope_Controlling_Software" (Figure 4) contains 1. the controlling software "Wyrdoscope_REG_Control", 2. the Displays controlling software."Wyrdoscopy_displays_control" and 3. their C++ source files "Wyrdoscope.cpp" and "Wyrdoscopy_displays_control.cpp". It gives you read and write access. In the file "config.txt" you can change the bitrate which represents the collected bits per second the REGs are collecting data (The default value is 200). The serial number is also provided in this file and must not be changed as otherwise it might be difficult for our support team to track problems on your specific Wyrdoscope.

Any updates to the software, which will be provided by our support team must be copied (overwrite the old file) into this folder. After the new version is copied into this folder, restart your Wyrdoscope and it will run with the new software.
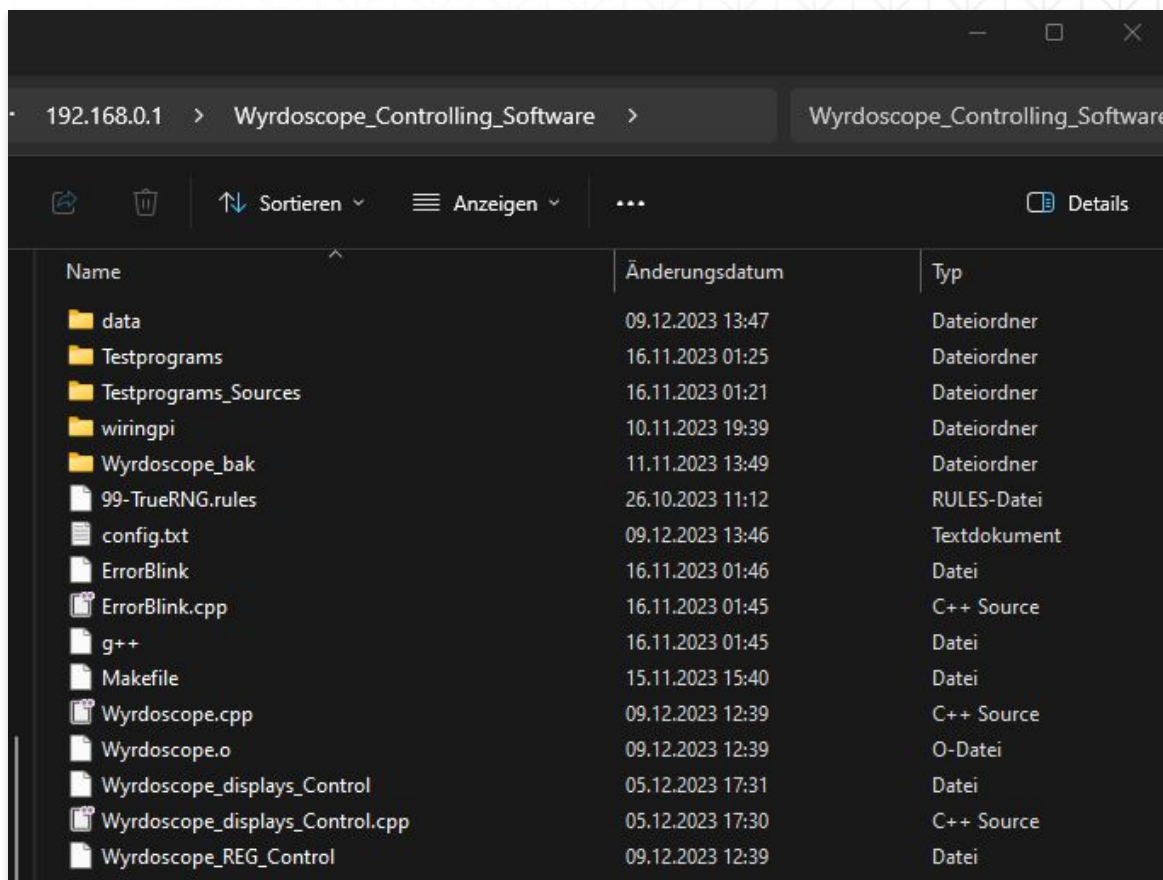

Figure 4 The content of the Wyrdoscope_Controlling_Software folder

4. Accessing the Wyrdoscope Data

The "Wyrdoscope_data" folder (Figure 5) gives you full access to all your REG data files and audio recordings. The audio recordings are stored in the "Audio_Recordings" folder. To process them further with our analysis software just select all (CTRL+A) entries in this folder and copy or move them over to your computer. The analysis software can directly read the data from there. Please do not rename any of the files, neither in the Wyrdoscope folder nor on your external computer, otherwise the analysis software might not be able to load or display the data correctly. It also expects the audio files to be in the related folder "Audio_Recordings", so please do not remove or rename this folder.

For MAC and Linux users: Choose your favourite file browser and follow the same process. The file browsers must be able to display samba folders, which is a normal feature of all popular file browsers.
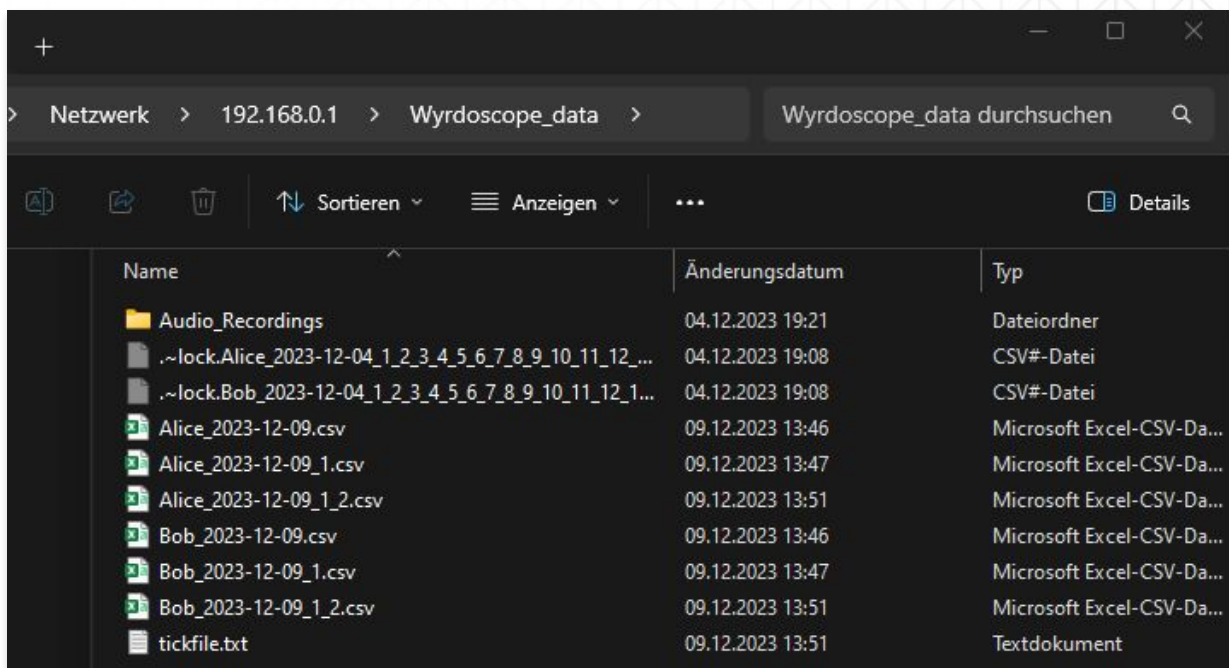

Figure 5 Typical content of the Wyrdoscope_data folder

4. Accessing the Wyrdoscope Data

4.3 Access the full desktop with VNC

For advanced users, the Wyrdoscope grants access to the full desktop via VNC (virtual network client). Download a VNC client (e.g. Real VNC) and access the desktop by entering "192.168.0.1" into the address bar of the VNC client. After establishing a connection a picture similar to Figure 7 should show up. You can see the Start up and monitoring program, the Wyrdoscope REG Control and the Wyrdoscope display control software in action. An information shell shows the serial number of your Wyrdoscope. You can fully develop your own Wyrdoscope Controlling software by adapting the provided Source Code in the C++ files. The source files provide compiling instructions in the comments. The main software "Wyrdoscope_REG_Control" is compiled using a Makefile.
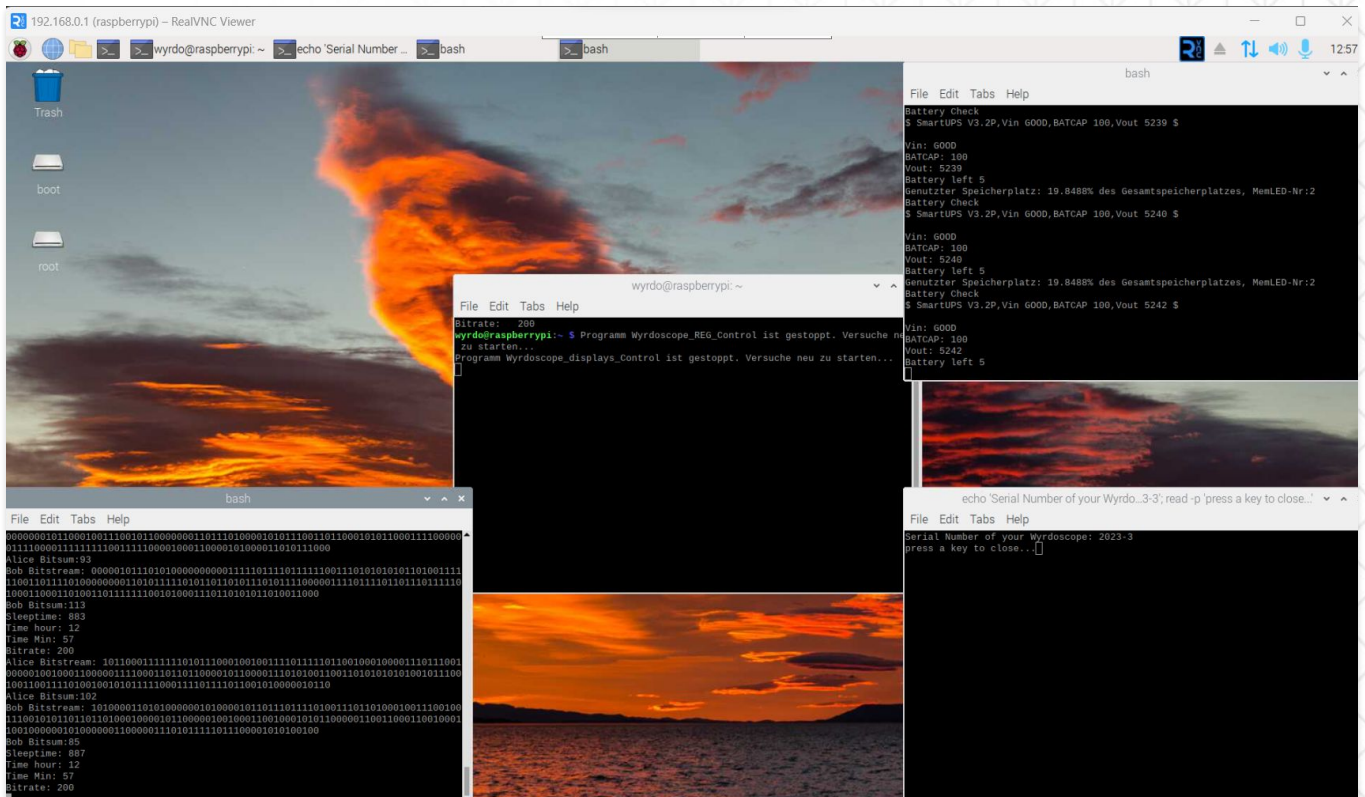

Figure 7 VNC desktop after logging into the Wyrdoscope

4.4 Access the full desktop in the PRO version

The Wyrdoscope PRO version has an additional HDMI port and four USB 3.0 ports at the front end. You can plug in a monitor, mouse and keyboard and use the Wyrdoscope like a full computer. This is especially usefull if you want to develop your own applications using additional hardware which can be plugged e.g. to the USB ports. Have fun playing and hacking!
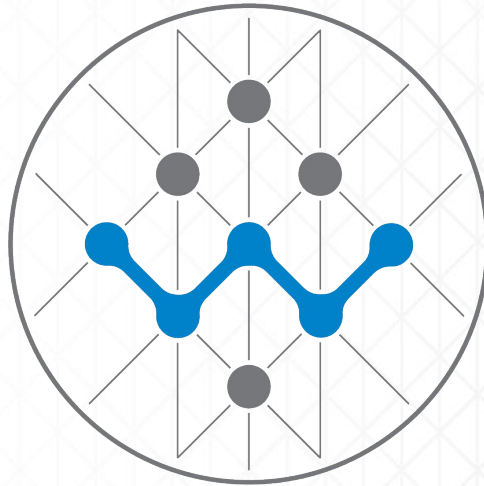
5. Bug Reports

5.1 How to report a bug

Should you encounter an error that looks like a bug, it is important to report this to Wyrd Technologies, so that it can be fixed. An error report can be filed at: <insert web page> (via help scout)

A few tips on how to report an error:

- Use a descriptive title about what does not work as intended

- A detailed description of the problem, including the steps to reproduce it is important. Be Specific and to the point. Try to summarize the problem in minimum words yet in an effective way. Do not combine multiple problems even if they seem to be similar. Write different reports for each problem.

- Always specify the used operating system (Windows, Linux, MacOS).

- Always specify the used version.

- In the bug report, specify the information from the Version

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