SunSDR2Pro - Remote Control

The SunSDR2Pro is a direct sampling 16-bit SDR transceiver for the frequency range 9kHz to 65MHz (SW) and 96-148MHz (2m). To operate the transceiver, download the "ExpertSDR2_x64_v.1.3.1_ SunSDR2_setup.exe" software from *https://eesdr.com/en/products-en/transceivers-en/sunsdr2pro-en#software* and run it on a PC/Notebook (Windows 7 to 11). After the installation, the start icon "ExpertSDR2 SunSDR2" appears on the screen.

SunSDR2Pro - HF/6m/VHF SDR Transceiver

Software display Icon

The SunSDR2Pro is network-compatible via its LAN interface, similar to a network printer or mass storage device, and can be connected to all PCs in the home network. An additional server is not required in the home network, and no drivers need to be installed.

There are three ways for remote control of the SunSDR2:
1.) Connection to only one PC in the home network
2.) Connection to all PC's in the home network
3.) Connection to the Internet, to remote control the SunSDR2 worldwide

1.) SunSDR2Pro with a connection to one local PCs

The SunSDR2 is connected directly to a local PC (PC 1) using an Ethernet cable **(Fig. 1)**. After installing the software and starting the "ExpertSDR2 SunSDR2" program, an error message "Can't connect to SunSDR2!" appears on the PC screen **(Fig. 2)**.

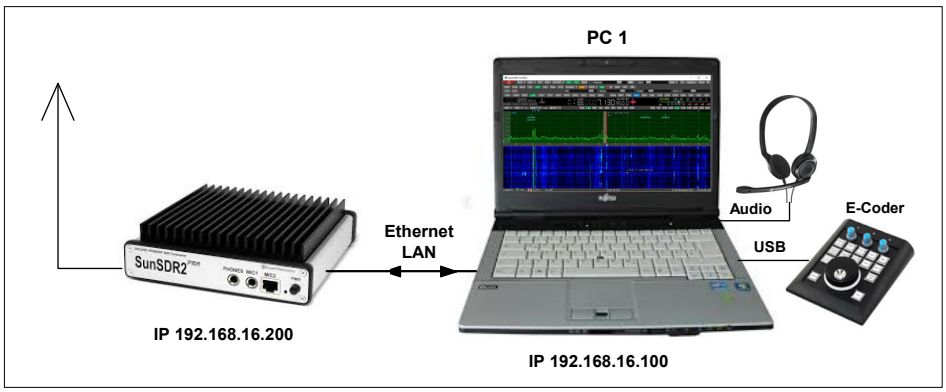

Figure 1: Direct connection to a local PC

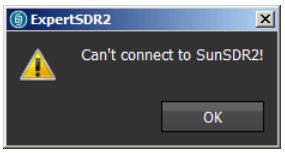

Figure 2: Error message from PC1

This is because PC 1 cannot see the SunSDR2Pro because its IP address does not match that of the TRX. The SunSDR2Pro is factory set to the IP address 192.168.16.**200**. So that a connection can be established, on PC 1 go to *Network and Sharing Center -> Local Area Connection -> Properties -> Internet Protocol TCP/IPv4* and set the IP address of the PC to e.g. 192.168.16.**100 (Fig. 3)**. The first three bytes (192.168.16.....) are fixed, the value of the last byte can be chosen anywhere from 1 to 255, except 200, this byte is used by the SunSDR2Pro.

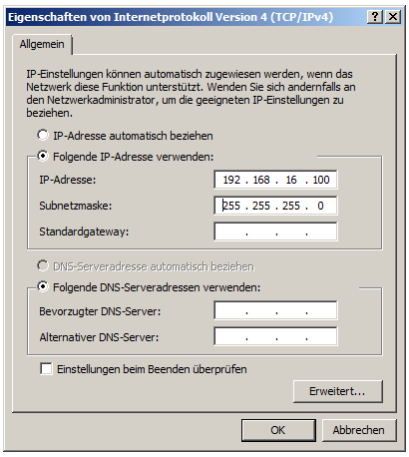

Figure 3: Changing the IP address of the PC to 192.168.178.100

After restarting the software, the SunSDR2Pro is recognized by PC1, the program opens **(Figure 4)** and the SunSDR2Pro can then be remotely controlled from this PC.

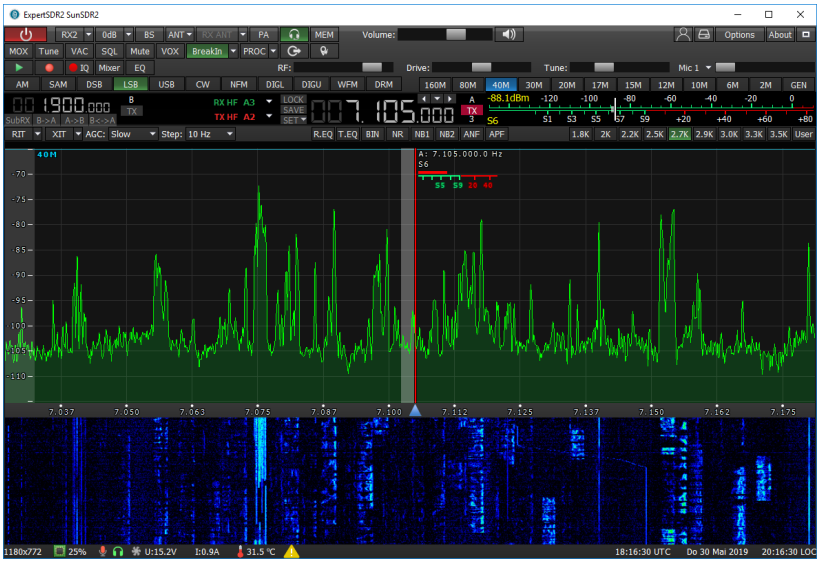

Figure 4: SunSDR2Pro display with direct LAN connection to a PC

2.) SunSDR2Pro with connection to all PCs in the home network

The next step is to connect to the home network so that the SunSDR2Pro can also be remotely controlled from all other PCs in the LAN/WLAN home network, such as from the living room or

garden. To do this, connect the SunSDR2Pro to the home network router to which all other PCs are also connected using an Ethernet cable **(Figure 5**). When the program starts on PC 2, the SunSDR2Pro is again not recognized and the same error message appears as before (**Figure 2)**, because the IP address of the router does not match that of the SunSDR2Pro (192.168.16.200). So a suitable IP address for the SunSDR2Pro must be selected here.

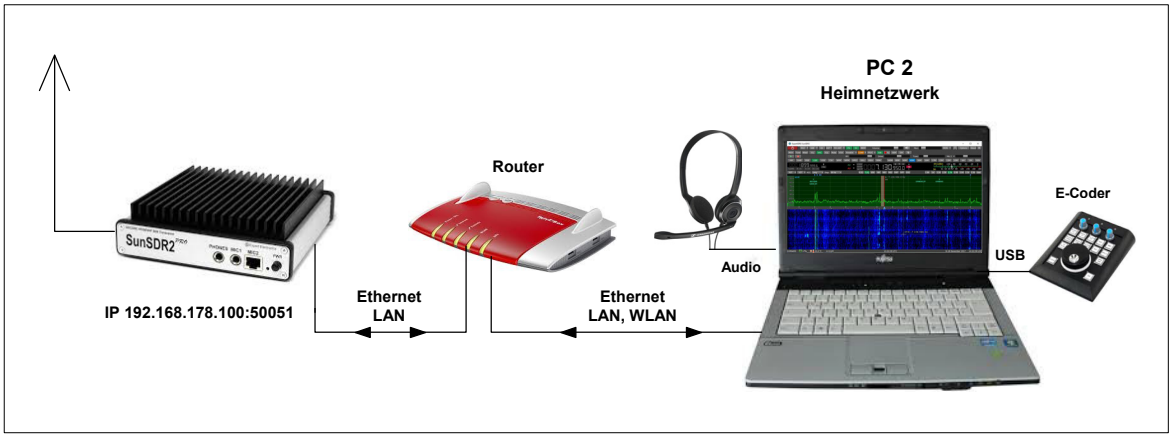

Figure 5: Connection to any PC in the home network

First of all, it must be determined which IP address is still free in the router's network. To do this, open the router and check under *Home network -> Network* which IP addresses are already occupied in the network. Then start the program again (under settings according to figure 1!), go to *Options -> Expert* and enter a free IP address in the *"New IP Address" field* , for me it was the address **192.168.178.100** and with " Set IP Address" and confirm "OK" **(Figure 6)**.

Note: The SDR port is factory set to 50001. If this port is already occupied by another device in the network (this was the case with me), a free port must be selected here, such as **port 50051**.

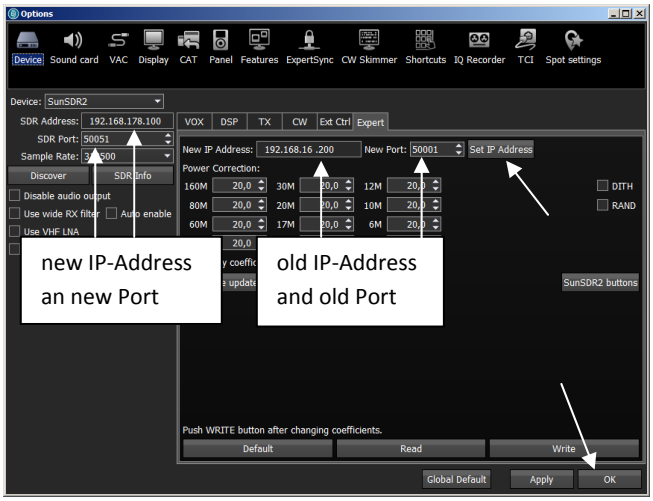

Figure 6: Changing SDR IP address and port, IP address: 192.168.178.100, port: 50051

After saving the data, switch off the SunSDR2Pro, disconnect the Ethernet cable from PC1 and connect it to the router's LAN interface as shown in **Figure 5.** Then switch on the SunSDR2Pro again and wait until the green PWR LED lights up continuously. Then start the program, go to *Options -> Discover*, whereupon a window "*Found SunSDR2 Transceivers"* opens, which shows the selected address and port **(Figure 7).** After pressing *"USE* " the user interface of the SunSDR2Pro appears after a few seconds on the PC screen and the connection to the home network is established **(Figure 7)**. In this way, the SunSDR2Pro can now be remotely controlled from all PCs in the local network on which the "ExpertSDR2 SunSDR2" software is installed.

Figure 7: SunSDR2Pro found in the home network (left) and screen of the SunSDR2Pro (right)

So that PC 1 **(Figure 1)** can continue to be used to control the SunSDR2Pro, it must be able to automatically obtain its IP address from the router again. To do this, go to *Network and Sharing Center -> Local Area Connection -> Properties -> Internet Protocol TCP/IPv4* and select "Obtain an IP address automatically".

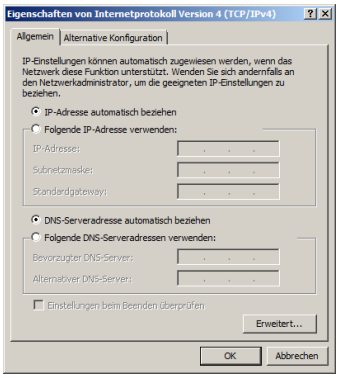

Figure 8: PC 1 reset to "Obtain an IP address automatically"

3.) SunSDR2Pro with connection to the Internet

For remote control via the Internet **(Figure 9)**, a so-called "Server/Client-Connection" is required. Any PC/notebook in the home network can act as the server PC. For this, download the software **ExpertRS** (Remote Server) and **ExpertRC** (Remote Client) from *https://eesdr.com/en/expertsdr2-en/expertremote-en* (ExpertRS_x64_0.6.5_setup.exe, ExpertRS_x64_0.6.5_setup.exe und ExpertSDR2_x64 _1.3.0_RemoteClient_setup.exe) and install them on the server and client PC.

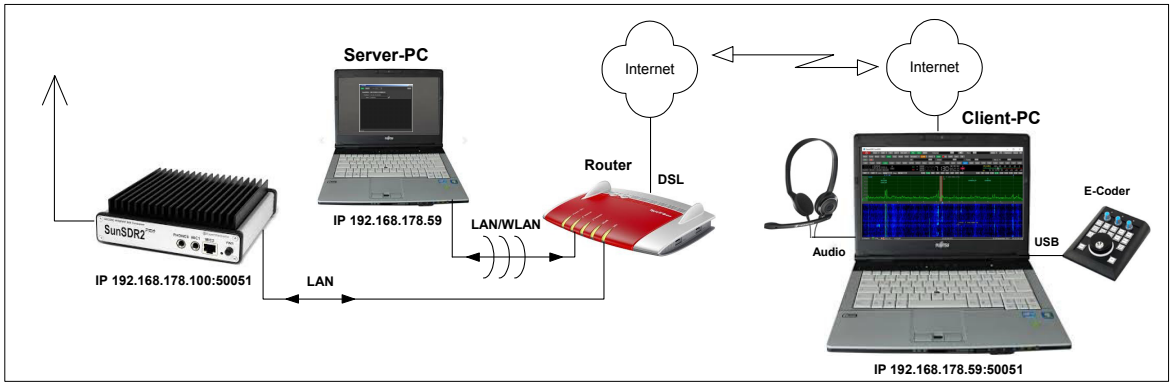

Figure 9: Control of the SunSDR2Pro via the Internet

3.1) Setting up the Server PC

Start the "ExpertRS" program on the server PC in the home network, select *Search* and the SunSDR2Pro will then be found under its address in the network **(Figure 10, left)**. The port for forwarding is set to 5050 by default. Enter the current port here, in the example port: 50051. The window can be closed afterwards, the server remains activated nevertheless, in the lower, right edge of the screen, the icon of the activated Expert remote server is indicated **(Fig. 10, right)**.

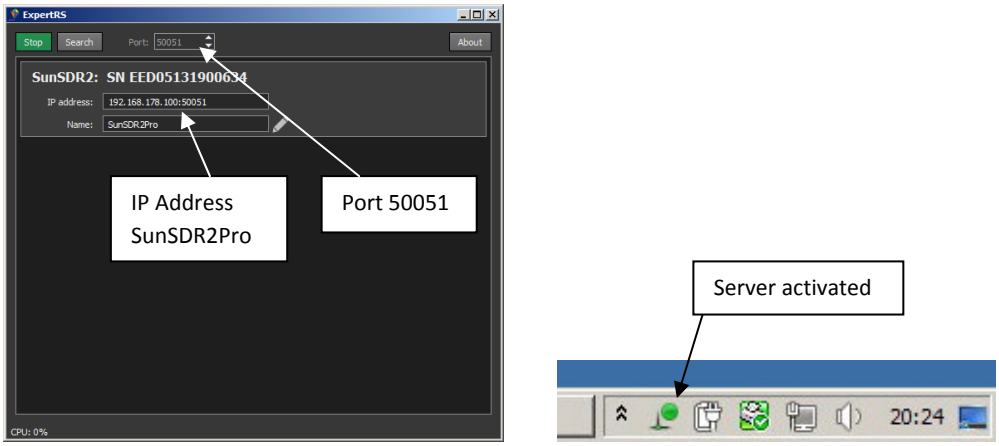

Figure 10: ExpertRS started (left) and display of activation in the bottom right corner of the screen (right)

Furthermore, a so-called "port forwarding" must be carried out on the Server PC. To do this, open the router and release ports 50051 to 50053 (data and audio) of the Server PC under TCP and UDP **(Fig. 11 and 12)**. The public IP address of the router is displayed during the installation, make a note of it!

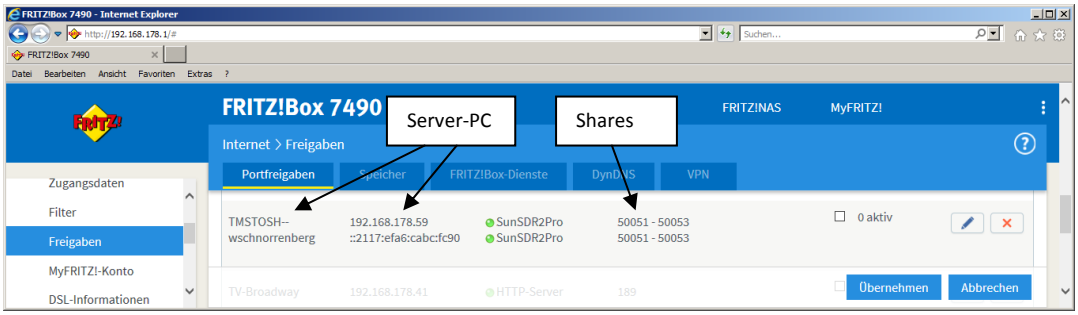

Figure 11: Enabling ports 50051 to 50053

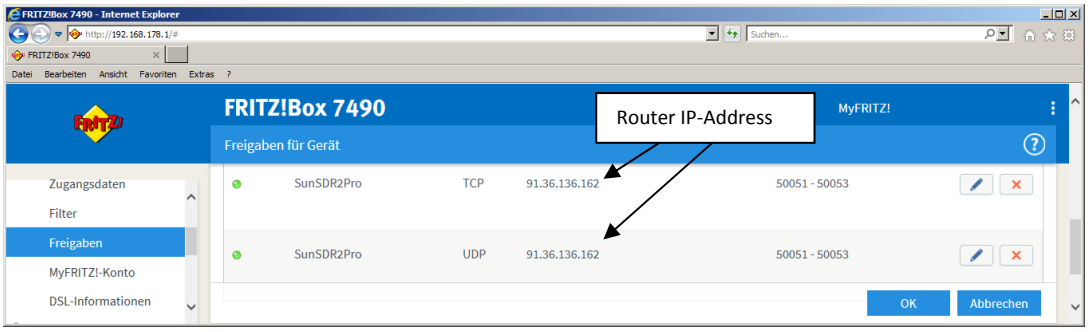

Figure 12: Sharing of the server PC with specification of the public IP address of the router

3.2) Setting up the client PC

Start the "ExpertSDR2 RemoteClient" program on the client PC and enter the public IP address of the router and the port of the SunSDR2Pro under *Options -> Network* **(Figure 13)** and finish with *Apply*

and *OK* . After starting the program, the SunSDR2Pro is found on the Internet and can be remotely controlled worldwide via the Internet **(Fig. 14)**. The access works with LAN, WLAN, LTE and 3G (5G).

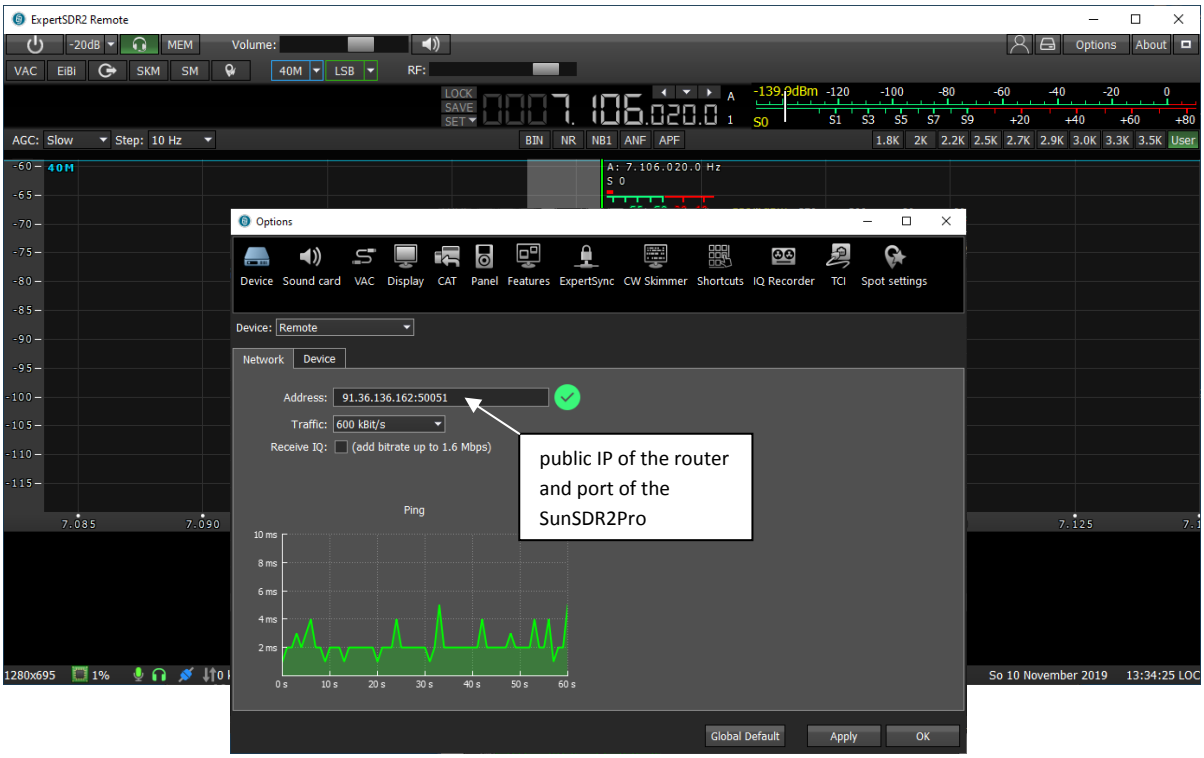

Figure 13: Enter the address in ExpertSDR2 Remote under Network, in the example: 91.36.136.162:50051

The sample rate can be selected in steps from 39062Hz to 312500Hz, corresponding to a span from 40kHz to 300kHz, with an adjustable sample rate (traffic) from 70kBit/s to 1MBit/s, whereby an upstream of 120kBit/s is usually sufficient in practice. If QSOs are conducted via LTE/3G (mostly chargeable), the selected size of the upstream should be considered. A 10GB SD card would be used up after 23 hours at 120kbit/s.

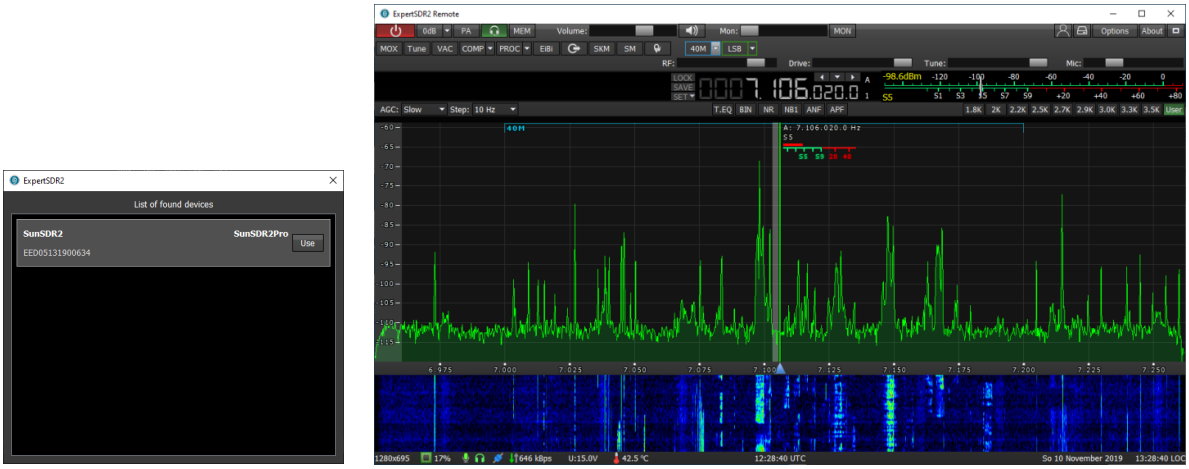

Figure 14: SunSDR2Pro is found (left) and can be remotely controlled from the Internet (right)

Dynamic DNS

Some routers change their public IP address assigned by the Internet provider on a daily basis for security reasons. If this happens, the SunSDR2Pro is no longer accessible via the Internet. If you use a FritzBox as router, the current IP address of the router can be determined at any time after registration with "MyFritz". MyFritz is an AVM server, which queries the IP, under which the device is attainable, in regular intervals. The function of DynDNS services is also based on the same principle.

After entering the current public IP address of the router (Figure 13), the SunDR2Pro can be reached again.
To bypass this procedure, you can also register with a DynDNS provider (Dynamic DNS Service). Then the SunSDR2Pro receives its own Internet address (Host Name), e.g. "www.name.spdns.org:50051", over which it is always attainable in the Internet. When this fixed address is called, the DynDNS provider then automatically uses the valid IP address of the router for each connection.

Firewall
So that the data can be exchanged between TRX and PC, the firewall of the PCs must be set accordingly. If an E-coder is used, it must also be enabled in the firewall, otherwise it will not be recognized.

Summary
The remote software of the SunSDR2Pro works excellently in all operating modes. Practically all functions remain, I could not find any restrictions.
Making QSOs over the Internet from distant PCs is just as easy as from the radio shack at home. The FFT display has an extremely fast repetition frequency, with great dynamics and at the same time high resolution, so that matching to stations is extremely easy compared to the remote software of many other devices.
The only disadvantage: So that the TRX can be operated from the Internet, a server/client connection must be established in the Radio Shack, i.e. a server PC must always be switched on at home. If you use a small and inconspicuous RaspberryPi3 as a server instead of a PC, things look a bit easier, as described under **(3)** and **(4)**.

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11/13/2019, Rev. 10.2021

Literature:

(1) Expert Electronics
https://eesdr.com/en/

(2) SunSDR2Pro-Test Report
CQ DL Magazine 9-2019
https://dc4ku.darc.de/SunSDR2Pro-Test_DC4KU.pdf

(3) ColibriNANO on the Internet
FUNKAMATEUR Magazine 04-2019
https://dc4ku.darc.de/ColibriNANO-im-Internet.pdf

(4) RemoteTx, remote software for IC-7300
FUNKAMTEUR Magazine 10-2019
https:// dc4ku.darc.de/IC-7300_RemoteTx.pdf

(5) Win4Icom, Remote Software for IC-7300
FUNKAMTEUR Magazine12-2019
https://dc4ku.darc.de/IC-7300_Win4Icom.pdf

(6) RS-BA1 Ver2, ICOM Remote Software for IC-7300
FUNKAMTEUR Magazine 01-2020
https://dc4ku.darc.de/RS-BA1.pdf