

ExpertSDR3 1.0.0 Beta Release Notes

October 28th 2022

Release description

ExpertSDR3 1.0.0 Beta is designed for MB1, SunSDR2 DX/PRO/QRP transceivers and ColibriDDC, ColibriNANO receivers.

Server software ALPHA build 20221028 is designed for MB1, SunSDR2 DX/PRO/QRP transceivers and ColibriDDC, ColibriNANO receivers.

Please note that this is a **beta** version, the ExpertSDR3 is still under development. The ExpertSDR3 software is provided on an “as is” basis.

Expert Electronics will not be liable for any loss, suffered by the user as a result of their use of the ExpertSDR3 software. You use the software at your own risk and will be solely responsible for any damage to a transceiver/receiver or connected external devices that results from such activities.

Should you encounter any bugs, glitches, or other problems, please fill in the [bug report](#). Your help in this regard is greatly appreciated!

Firmware Control

Always make sure you use the latest firmware for your device!

ExpertSDR3	Comment	Date	Firmware
Beta 28102022	To use this ExpertSDR3 version you need to update firmware in SunSDR2 PRO/DX and MB1.	28 October 2022	86.8
Beta 28102022	To use this ExpertSDR3 version you need to update firmware in SunSDR2 QRP.	28 October 2022	11
0.13.0 Build 05102022	This build contains new E-Coder2 firmware. New E-Coder2 firmware works ONLY with the ExpertSDR3 0.13.0 build 01092022 and newer.	05 October 2022	-
Beta 28102022	This build contains new RadioSync 1.2.0 beta	28 October 2022	-

Revolutionary changes in comparison to ExpertSDR3 0.12.0:

1. New data exchange protocol between a transceiver and PC

Why it was required?

If you listen to the audio using the HP jack on the transceiver's front panel, in some cases you could hear crackling noises. This effect was caused by the PC performance and OS settings, these two factors have the biggest influence on the connection quality (presence of the audio artifacts) between a transceiver and PC. Sometimes you could fix that by a series of tedious manipulations with your PC, but in some cases, it couldn't be fixed at all.

Solution.

We decided to develop a **new data exchange protocol between transceiver and PC**. We've done extensive research, which allowed us to develop an absolutely new protocol from scratch. This **new protocol minimizes PC and OS influence on the data exchange**. From now on, CPU load or active apps (like Chrome or Skimmers) have little to no effect on the data exchange process.

Also, we've managed to set a **stable delay for audio played via HP jack**. Earlier, this characteristic may vary depending on many factors.

This new data exchange protocol still requires some polishing, which should be finished by the time we release the final version of ExpertSDR3 1.0.

2. New CW-core

Why it was required?

There are several sources of CW manipulation in ExpertSDR3:

1. KEY input in transceiver
2. KEY input in E-Coder2 panel
3. TCI

Also, there are several playback "instruments" for CW-signal:

1. Transceiver (firmware)
2. E-Coder2 (firmware)
3. ExpertSDR3:
 - Sound Card output
 - Line Out into Sound Card
 - Line Out into wave file
 - A special core which displays CW signal on the panorama

All mentioned CW cores (be it a firmware or software CW core) are not get notified about CW manipulation at the same time, but each with its own changing delay, which influences the resulting CW signals (what we hear).

Example:

Setup: CW key is connected to the transceiver, monitoring audio is routed via a PC Sound Card.

During operation, one character could be lost by the Sound Card, but the transceiver's CW-core didn't lose it and transmitted it on the air. As a result, the signal we monitor using the Sound Card is different from what we actually transmitted on the air. It could happen vice versa, so that the firmware core lost a character, but the Sound Card played it.

Solution:

We've reevaluated strict requirements for CW operation based on the experience we've gained through the years and developed **an absolutely new CW-core, for both firmware and software**. From now on, the mentioned issues are history.

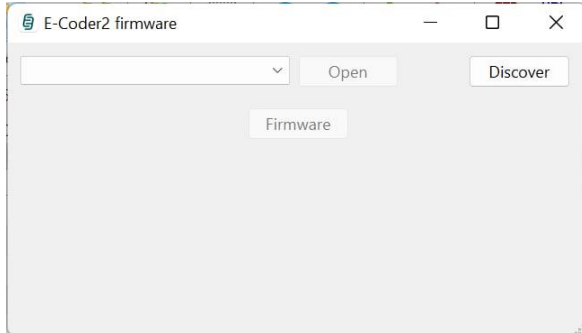
With new CW core, the **minimal monitoring delay (about 3 ms)** could be reached when both sources of CW signal and monitoring are in the same device, i.e., both CW-key and headphones are connected to transceiver or E-Coder2.

Also, new CW-core **improves CW macros operation using TCI**. From now on, **transceiver plays macros, not ExpertSDR3**, as it was before. Earlier, time intervals could vary when you used macros on certain PCs, it could be heard as uneven CW manipulation. When the transceiver does this job, the issue does not exist by default.

- New E-Coder2 firmware

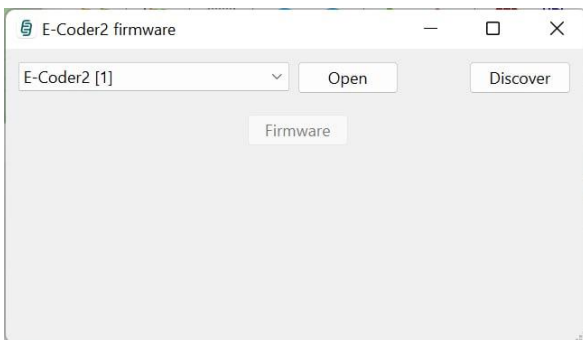
IMPORTANT!!!

New E-Coder2 firmware works ONLY with the ExpertSDR3 0.13.0 build 01092022 and newer versions.

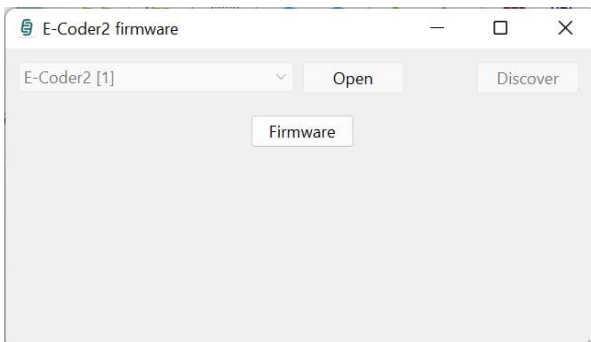


Installation procedure:

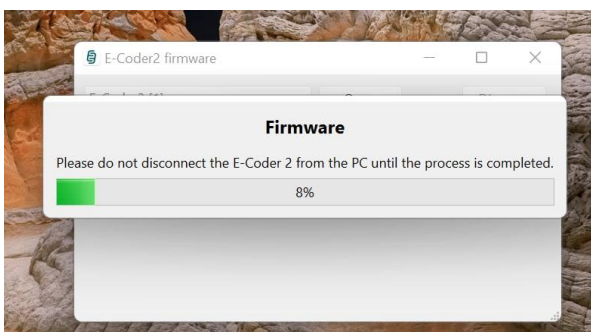
1. Launch the Ecoder2Firmware file, it's placed in the same folder with ExpertSDR3.



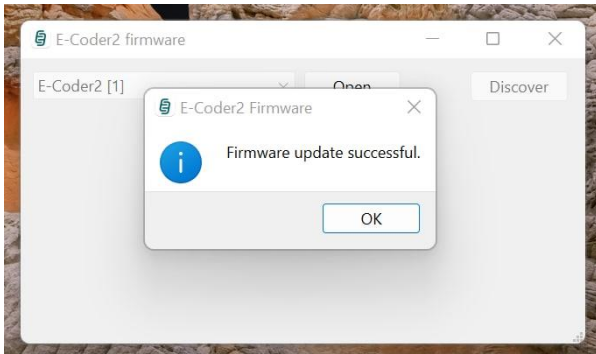
2. Press the Discover button, you'll see a connected to PC E-Coder2 panel. Then Press the Open button.



3. You'll see that the Firmware button is active, press it.



4. It'll start the Firmware update process.



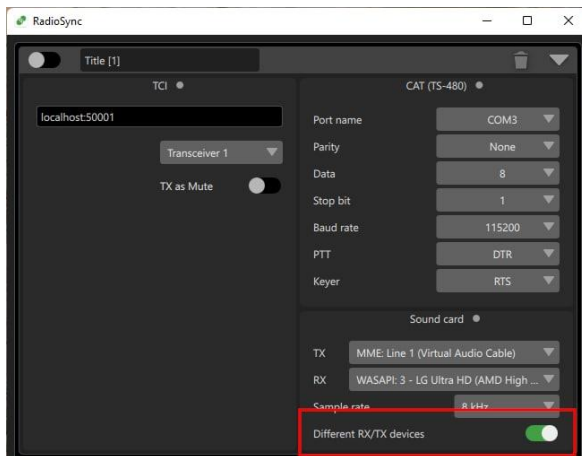
5. When the Firmware update is finished, you'll see this window.

That's all, enjoy your E-Coder2!

New features in RadioSync:

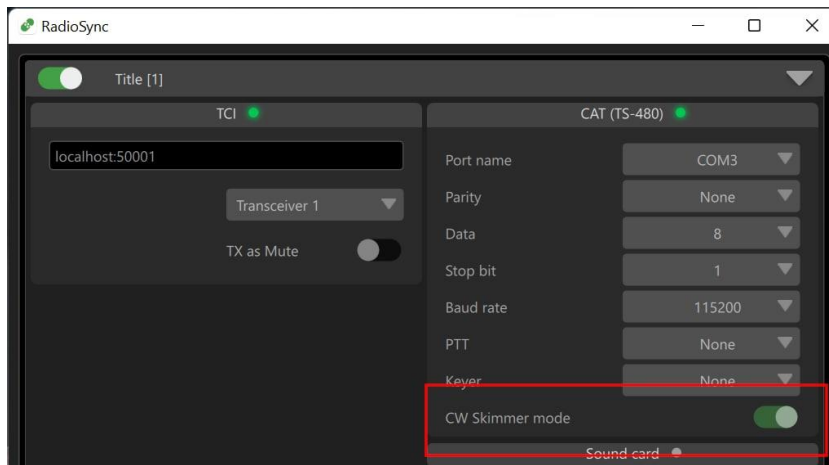
- **Prior to the installation of the new RadioSync version, delete the settings folder: C:\Users\User_name\AppData\Local\Expert Electronics\RadioSync.**

- From now on RadioSync will be installed along with ExpertSDR3. The launch file will be placed in the same folder (e.g. C:\Program Files\ExpertElectronics\ExpertSDR3).



- From now on you can select different devices for RX and TX audio in RadioSync.

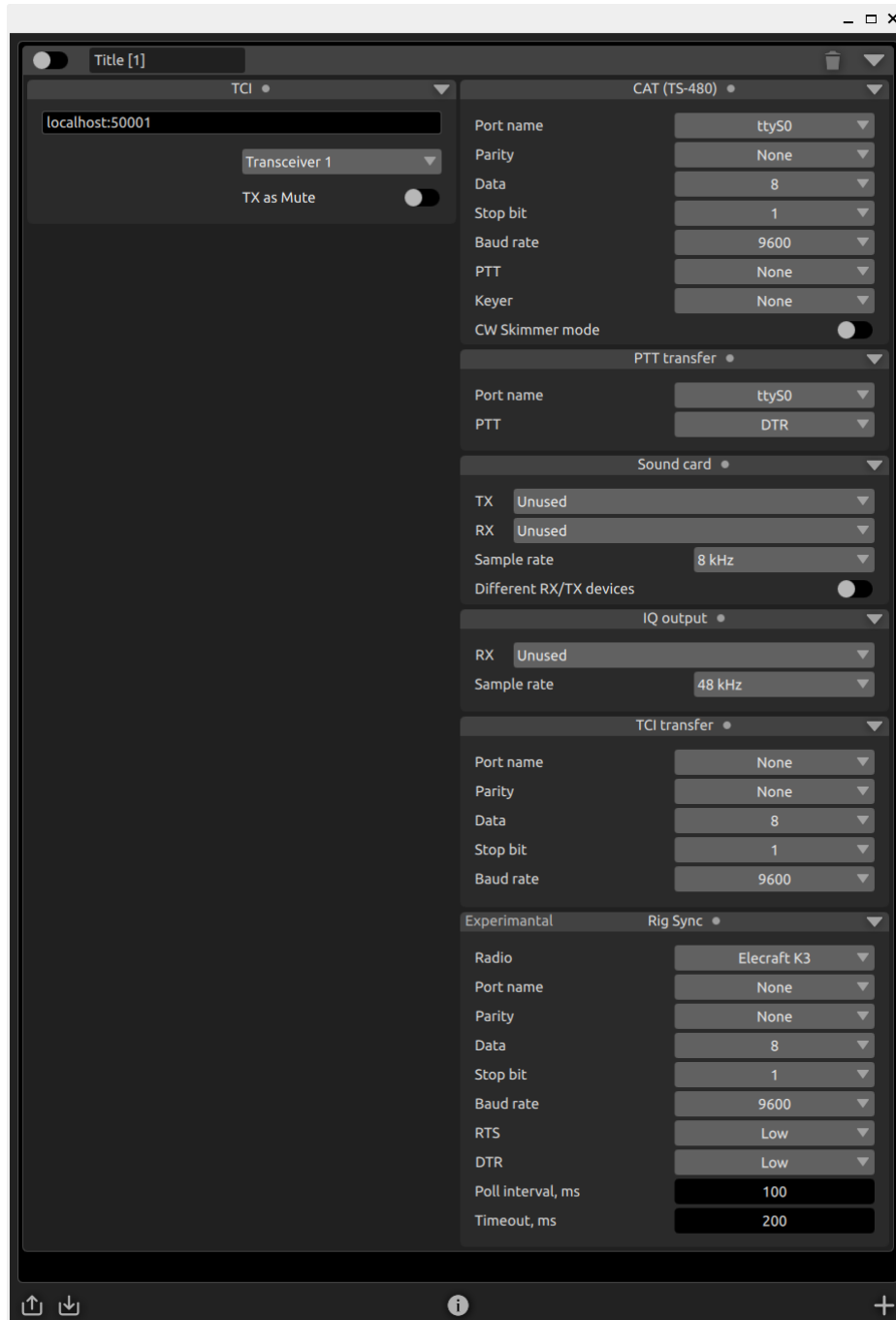
- From now on, you can transfer the IQ signal from TCI to the sound card via VAC, with a sample rate in the range from 48 kHz to 384 kHz.
- In the CAT interface section, we've added a special mode for correct operation with the CW Skimmer.



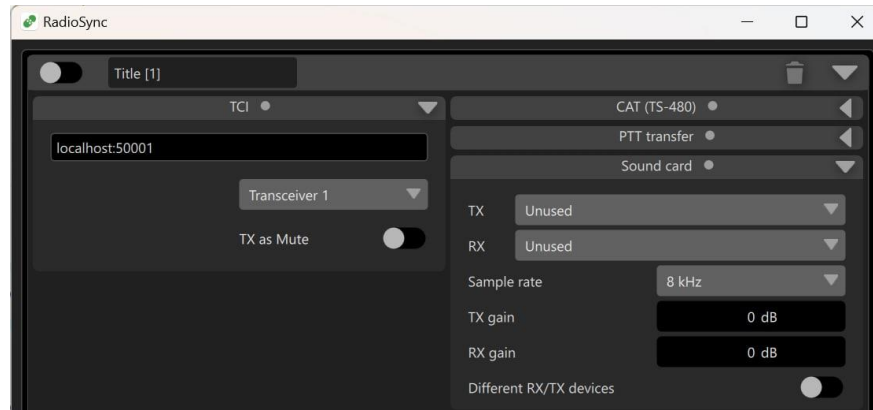
The tuning frequency displayed in the CW Skimmer corresponds to the center frequency of the panorama in the ExpertSDR3. The correct settings in the CW Skimmer: SoftRock-IF, the control works through OmniRig.

- Implemented TCI commands transfer via CAT. Command should have a prefix "TC:", command example: TC:volume:-6;
- Added PTT transfer - transfer of PTT signal from E-Coder/2 panel into TCI, actively used for N1MM.

- Added experimental module Rig Sync - it duplicates OmniRig functionality, and should be used to sync ExpertSDR3 with third-party classical transceivers. Connection was tested with Elecraft K3 and Kenwood TS-2000.
- Improved design of RadioSync program.



- Added gain control for RX and TX channels in Sound card module (VAC).



- Information for developers:**

We've created a new module for exchanging TCI commands between RadioSync and third-party software via a COM port. It was created specifically for those programs that have a COM port, but there is no way to use web-socket as a command exchange interface. In this case, you can only control the other software, because IQ and audio signals cannot pass through the COM port.

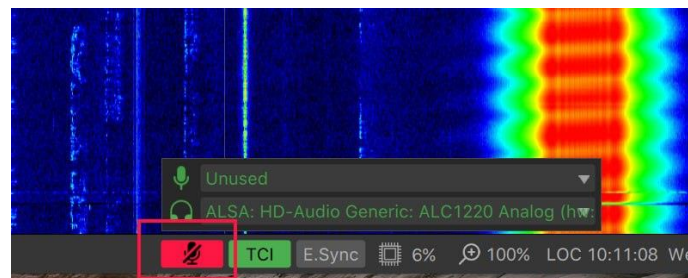
TCI protocol uses web-socket interface for data transfer, but not all developers can / want to implement web-socket in their software. You can reach out to developers who have not yet supported TCI in their software by telling them about a more familiar way to support TCI via a COM port.

New features:

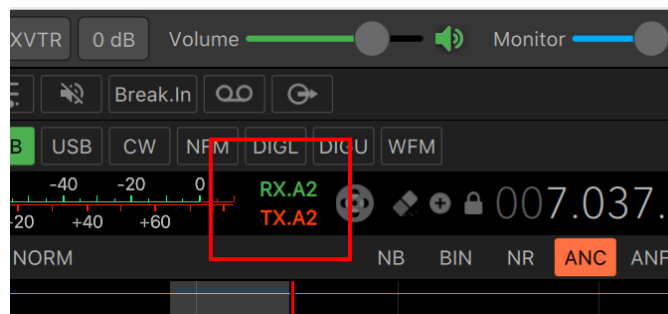
- Added big external S-meter which indicates Mic level, SWR and output power. Now you can also change its size.



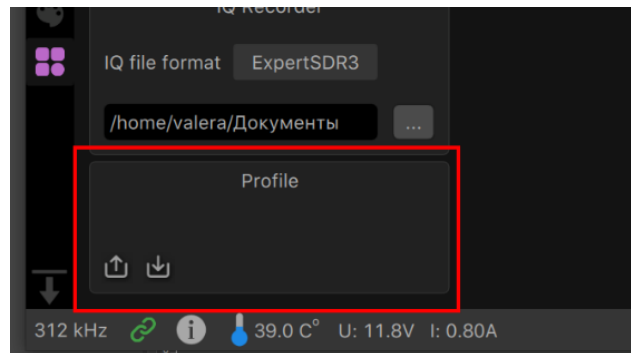
- If you've selected MicPC for transmission, but haven't selected it in the Sound Card settings, software will inform you about it.



- When you change the name of transverter band, new name will display everywhere in the software
- Now you can control antenna switch from the main software window



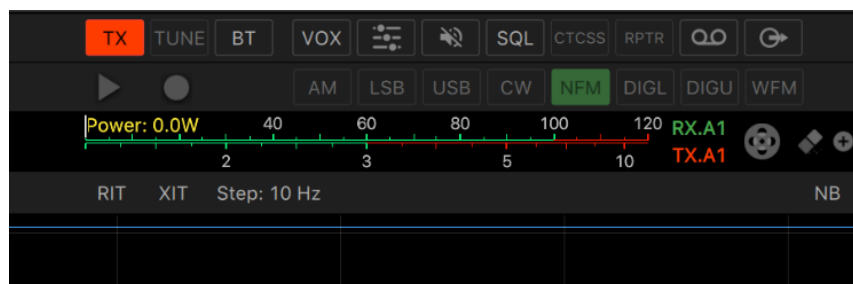
- Added import and export of global settings



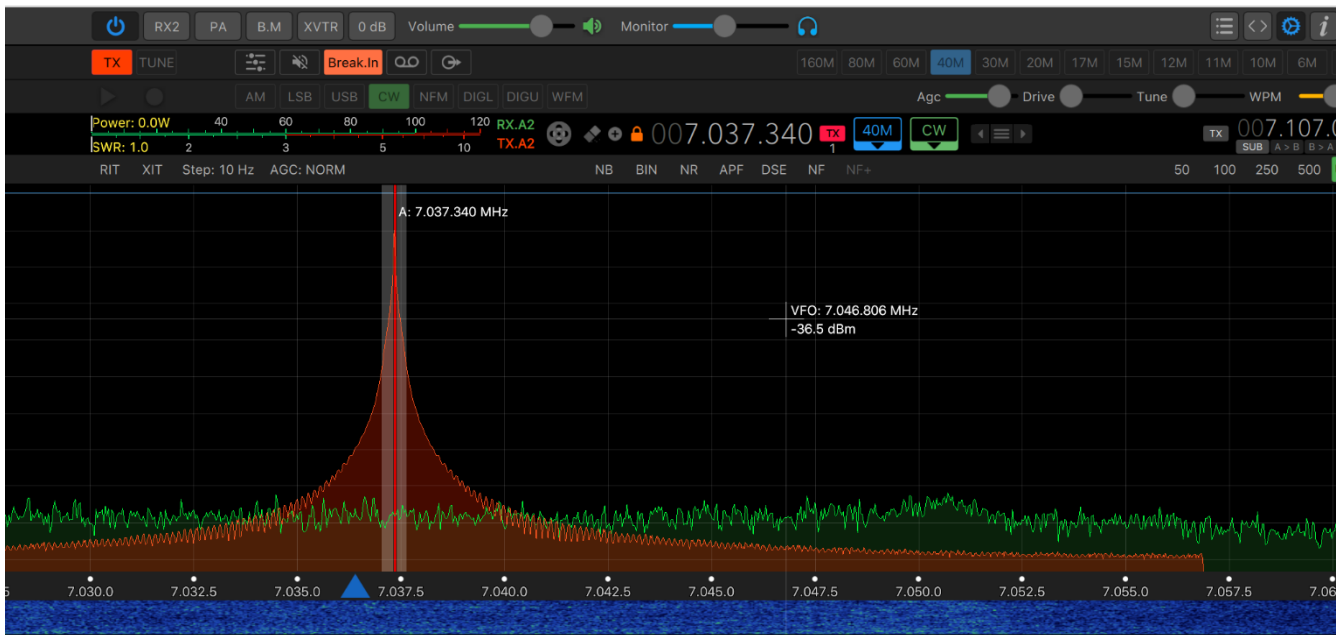
- Added possibility to enable certain bands, if they are locked for a selected region.
- Extended TX range** feature is now available. Requirements and warnings for this procedure are the same as before, to be able to unlock TX range please contact us directly.
- In transverter settings you can set the frequency up to 99 GHz.
- Added function to sync audio balance of channels A and B in relation to IF filter position.



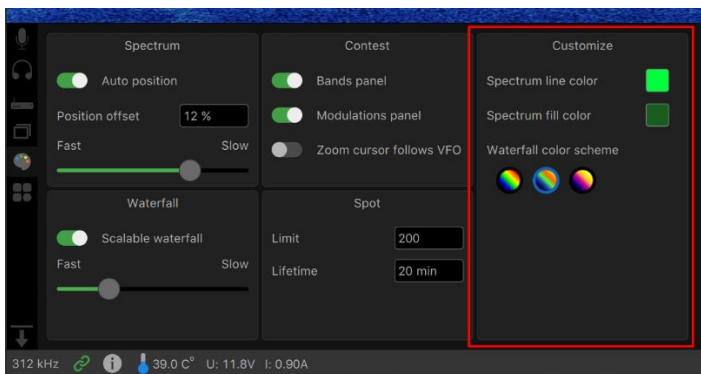
- Removed SWR indication for frequencies above 60 MHz, it never worked there before because of hardware limitations



- Added display of the output CW signal on panorama during transmission.

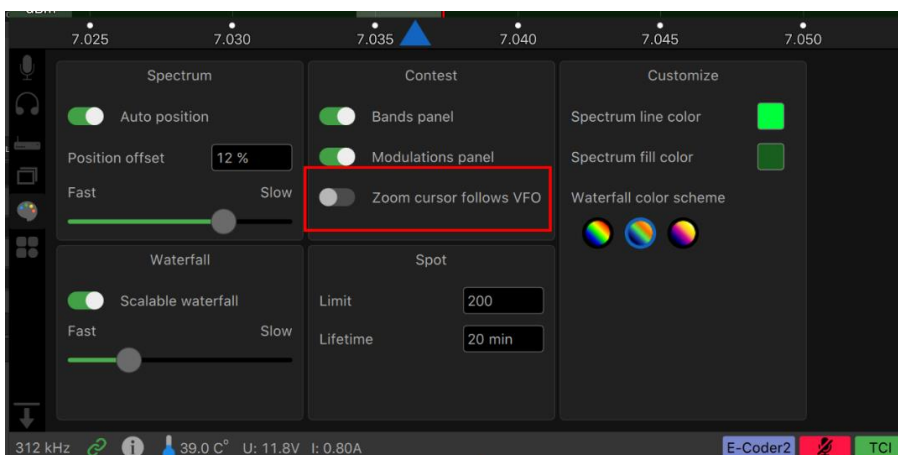


- Now you can select Spectrum line and fill color



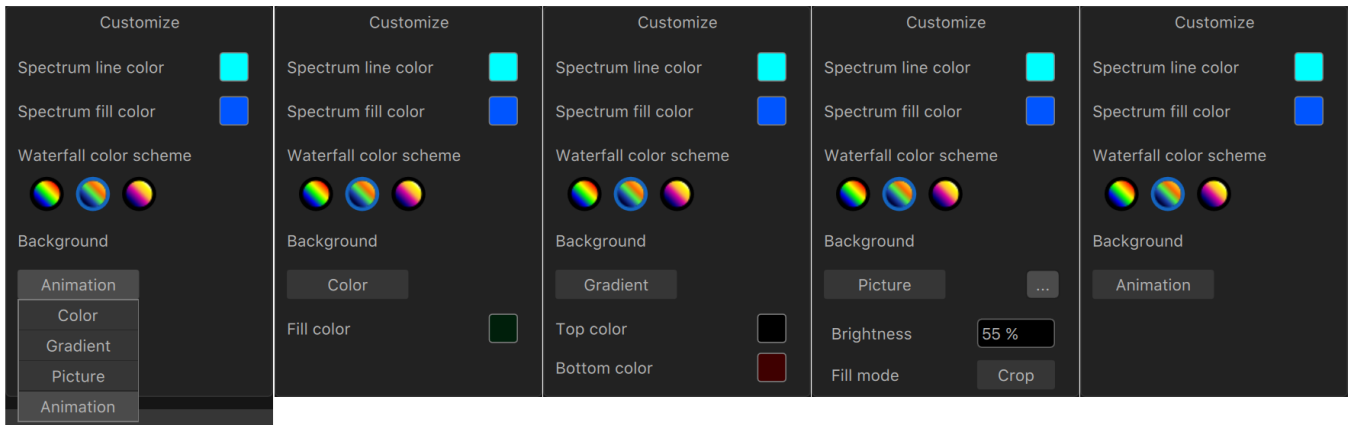
- We've added 3 color presets for waterfall

- While transmitting the record made with voice recorder the volume is set to max level.

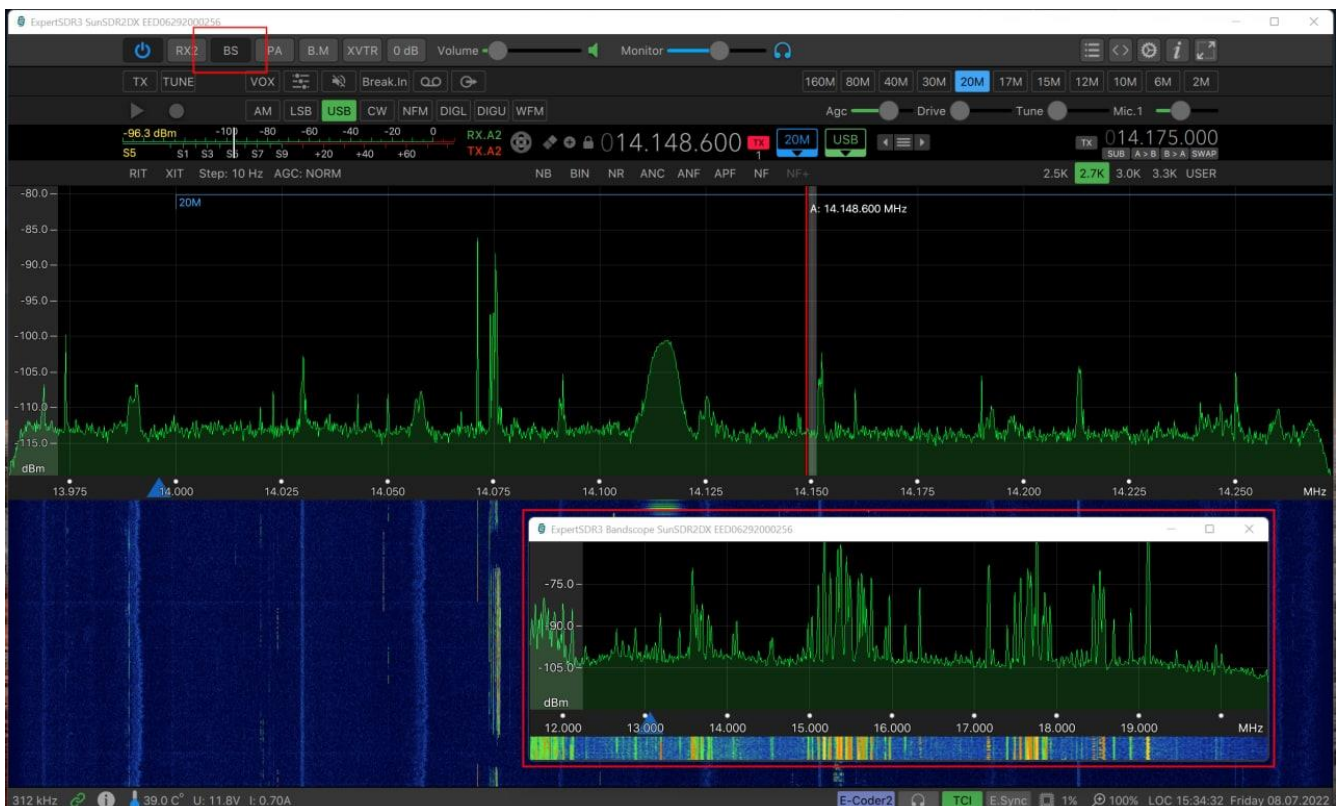


- Now you can deactivate the zoom cursor following the frequency set from TCI.

- TCI protocol updated to version 1.9, we've added control for audio stream parameters.
- We've implemented new customization capabilities:
 - Set plain background color (right-click on the color palette sets default color)
 - Set gradient background color (right-click on the color palette sets default color)
 - Set image as a background, you can choose between 3 scaling types and adjust image brightness (right-click on the selection field sets default image)
 - Also, you can set a snowflake animation as a bonus 😊



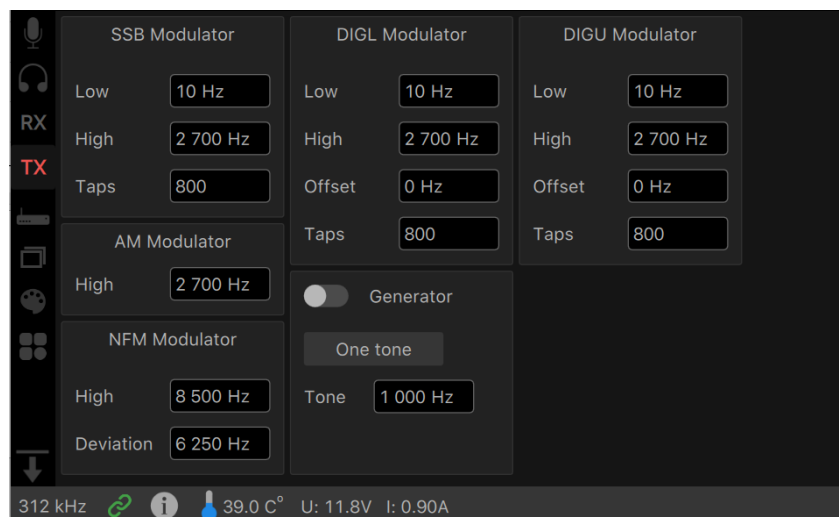
- Added BandScope feature (in development).



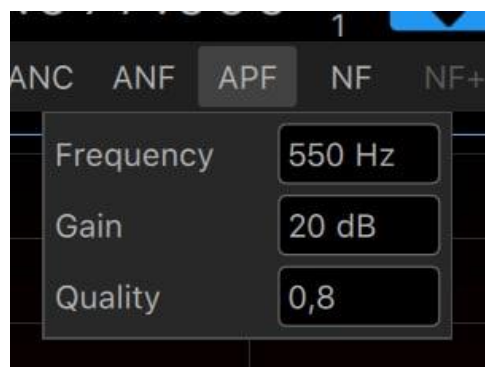
- We've added a new section with RX DSP settings. For SSB (LSB/USB), CW, AM, NFM, DIGI (DIGL/DIGU) modes of communication you can set the AGC settings, filter taps, adjust filter bandwidth presets and name these presets. This is an absolutely new function for our software.



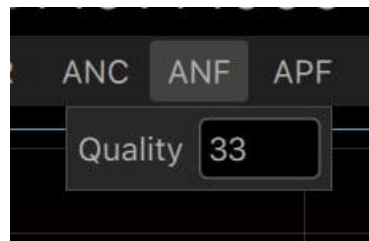
- TX DSP settings also have a separate section now.



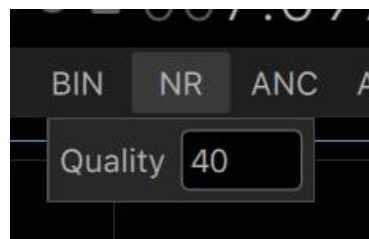
- You can call a menu with APF settings by right-clicking on the APF icon (right-click on each parameter will reset it to the default value).



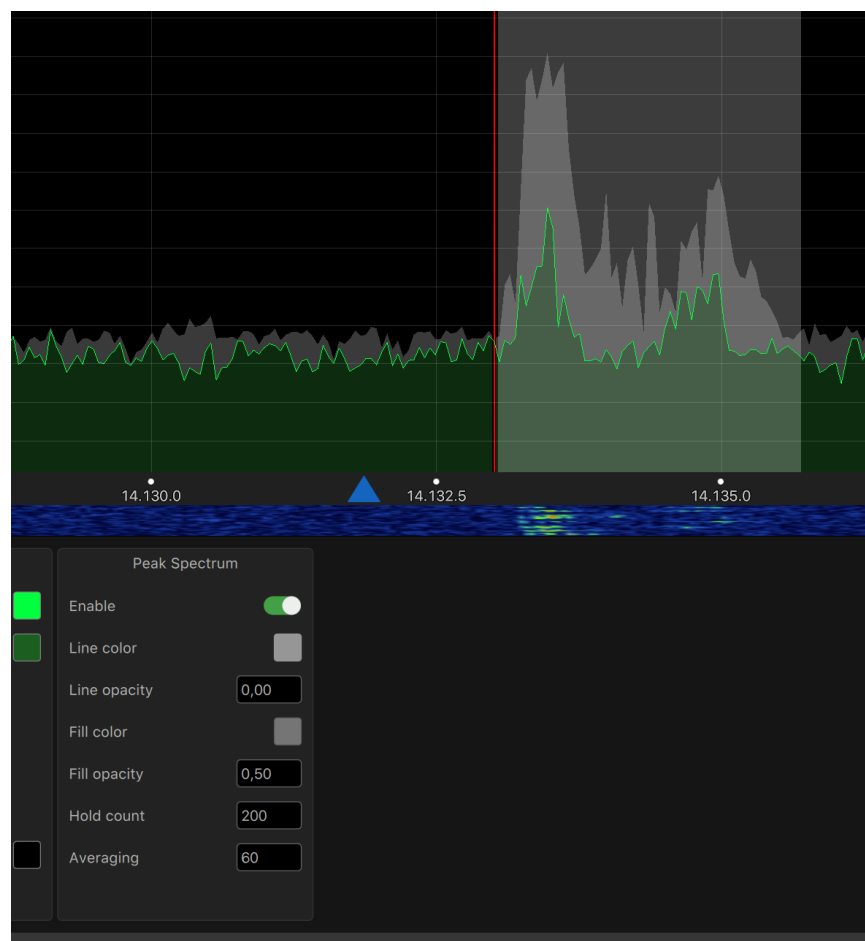
- You can call a menu with ANF settings by right-clicking on the ANF icon (right-click on the Quality parameter will reset it to the default value).



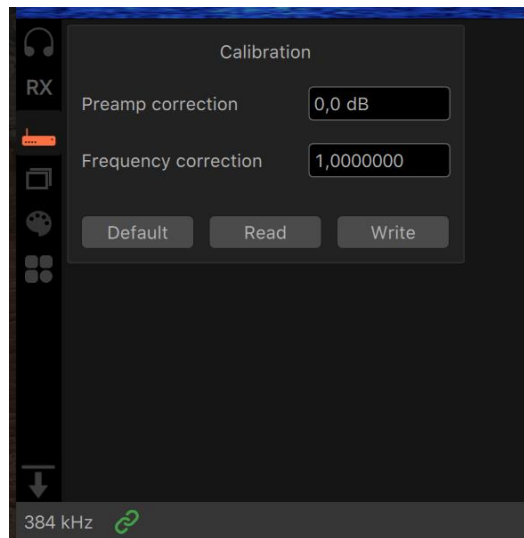
- You can call a menu with NR settings by right-clicking on the NR icon (right-click on the Quality parameter will reset it to the default value).



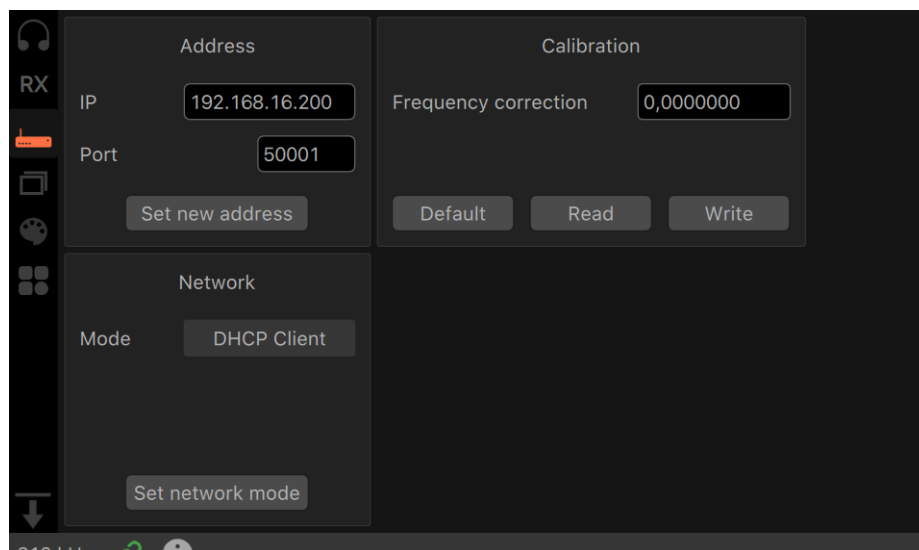
- Added display of peak spectrum with various settings.



- For ColibriNANO we've added a section with calibration settings.

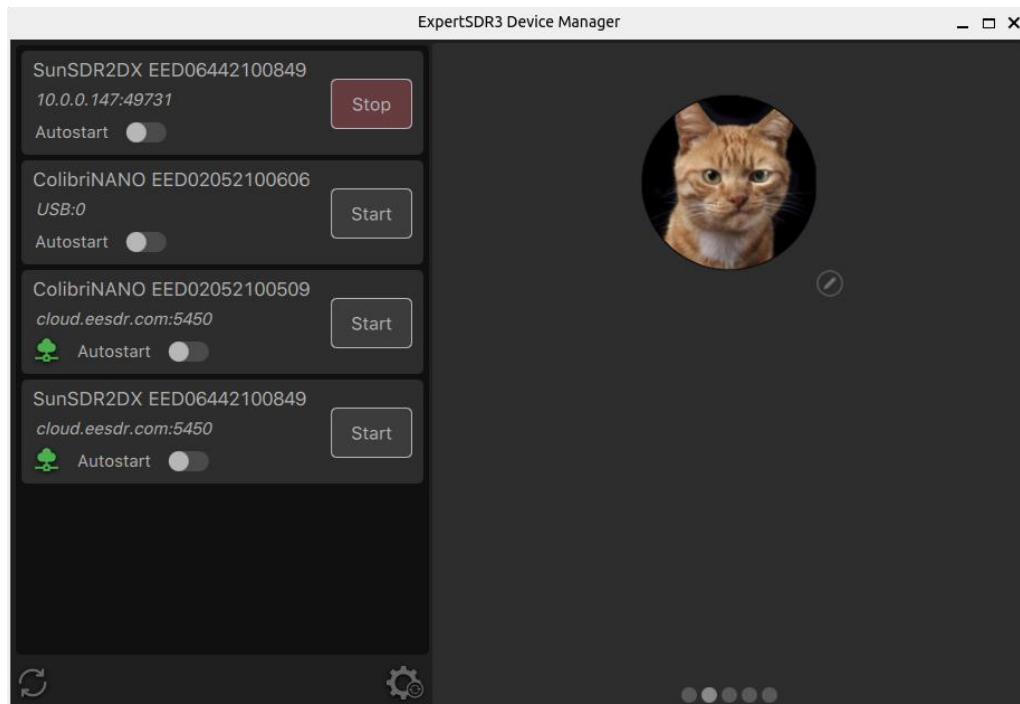


- For ColibriDDC we've added a section with various settings (IP address, network mode, frequency calibration).

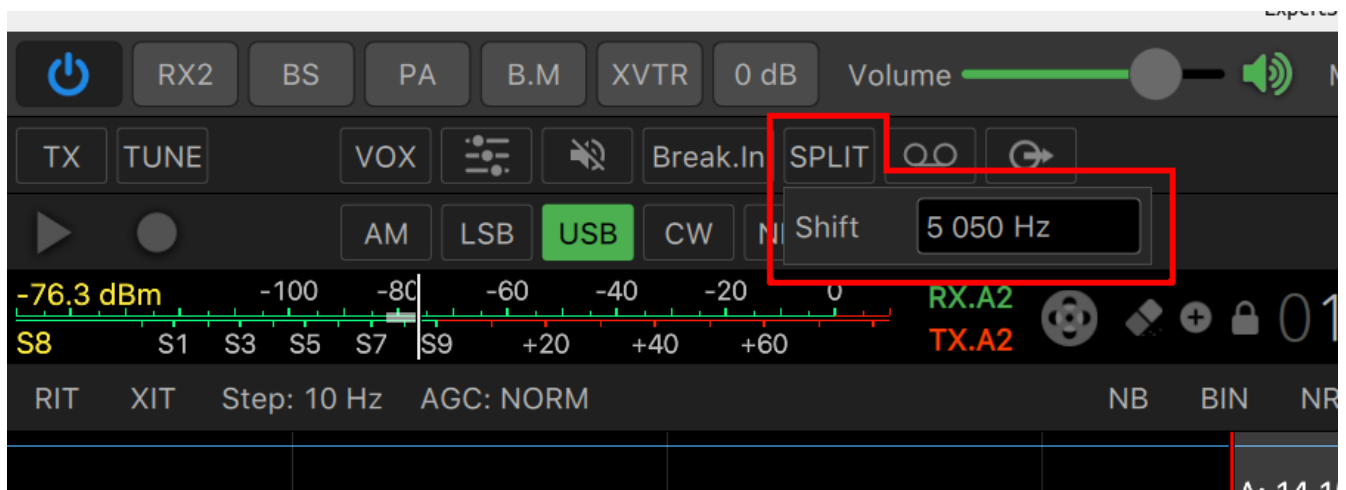


- We've implemented support of CW-keying via COM-port.
- Fully supported operation with straight CW-key in firmware for transceivers and E-Coder2.
- New experimental function. ExpertSDR3 will check the support of DirectX11 API in your Windows PC. If there is no DirectX11 support, then ExpertSDR3 will use OpenGL.

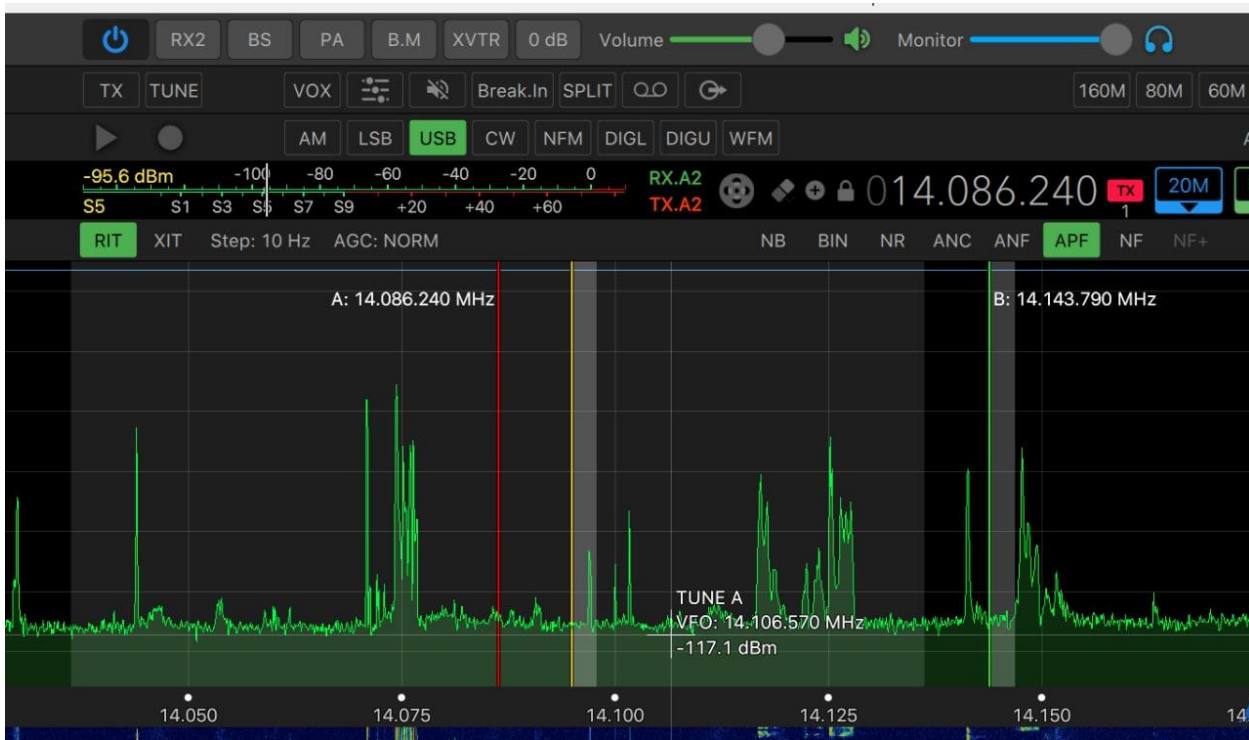
- Added AutoStart feature.



- Added SQL for AM mode.
- Added SPLIT button on the front panel of the software window. Click with right mouse button to open a drop-down menu and set **Shift** frequency to operate in this mode. TX is on the VFO B frequency. Shift parameter is saved for AM, LSB, USB, CW modes.



- When you enable RIT or XIT modes, VFO A filter becomes yellow, so you won't confuse it with VFO B.



- When you change certain parameters with horizontal knobs on E-Coder/2 or TCI these changes will be briefly displayed in the ExpertSDR3 window.

New features in ERS:

- Implemented TX mode for ERS (CW transmission is not supported yet). Transmission with MB1 is unstable, will be fixed in the software release version. To work in TX mode via ERS, you should select the MicPC in the software.
- Implemented PROC module for voice operation
- Implemented control of TX modulator settings, similar to the TX tab in ExpertSDR2
- Implemented antenna switch control
- Implemented ExtCtrl keys control
- Implemented PA key control
- Implemented VOX
- Now buffer size in client and server are synced in ExpertSDR3 settings
- RX DSP settings are now available for remote operation
- Software power correction in via Band Manager
- RX->TX and TX->RX delays for external PA

The ERS features we will implement in the ExpertSDR3 1.0 final release:

- TUNE mode
- ATU support for SunSDR2 DX and MB1
- CW mode transmission

Please note that this is not the final iteration of the TX mode in ERS.

Known bugs in the current ExpertSDR3 1.0.0 Beta 28102022:

- Several firmware bugs.

Copyrights

© 2019-2022 Expert Group. All rights reserved.

Expert Group

Polyakovskoe schosse, 16-3, ABK-1, off. 408

Taganrog, Rostov region, Russia, 347927

+7 (8634) 43-13-01

<https://eesdr.com/en/>