

# User's Manual

[Minion SDR (rev 1.2\_034)]

QRPver

[18.09.2019]



Thank you for purchasing the Minion SDR compact all-band shortwave transceiver.

This SDR transceiver is designed to work in the lower (LSB) and upper (USB) sideband with both a microphone (SSB) and telegraph (CW) as well as for receiving AM radio stations. It is possible to work in digital communications (DIGI).

Onboard the transceiver there is a USB port for connecting to a computer and controlling the transceiver from amateur radio programs via the CAT interface using the “Kenwood TS-440” protocol

The transceiver has small dimensions 100x103x30 mm. and a small weight of 450 grams. It is suitable for work on the field trip, on the nature, cottage ... The same for everyday work, at home.

## Technical specifications:

- Rated supply voltage 13.8v (8v. Min. 15v. Max.).
- Current consumption in receive mode “RX” and 25% volume: 120mA. At 100% volume: up to 200mA.
- Current consumption in transmission mode "TX": 1600mA. Max.
- Output power of the low-frequency amplifier: >0.5Watts.
- Transmitter rated output power: 5Watts. (at rated supply voltage). And more, up to 9Watts. Max. (Output power may vary not in large aisles depending on the selected range.).
- Receiver sensitivity: 0.35uV.
- The dynamic range of : 95dB.
- Carrier Suppression: 80dB.
- Non-working sideband suppression: 70dB.
- Dynamic range of the AGC system: 70dB.
- The spectrum display band on the display is 14 kHz. (Zoom x1).

- ✓ 50 Ohm antenna input impedance. *(We do not recommend connecting antennas with unknown characteristics, high CWS and “Reactive”. Tests showed that the transceiver keeps long work with CWS 2.5. And briefly 3-3.5. However, we do not recommend using antennas with CWS over 2.5). Use only matched antennas or use the QRPver ATU-100 antenna tuner to connect antennas with unknown characteristics. <https://qrpver.com/antennas/automatic-antenna-tuner-qrpver-atu-100.html>*

➤ **Receiver bandwidth:**

- CW mode: Set from the menu and has two presets (SHIFT 600-1000Hz., W. Band 200-1000Hz.).
- LSB/USB Mode: Set from the menu and has three fast access presets (HPF 40-400Hz, LPF 1500–3500Hz.).
- DIGI Mode: 3500Hz.
- AM Mode: 6000Hz.

➤ **Transmitter radiation band:**

- LSB/USB Mode: 3200 Hz Max. (It is set in the menu. Settings of the lower and upper cutoffs are 50-300, 2500-3200 Hz.).
- PDIGI Mode: 3500Hz.

**Functional:**

- Operating frequency ranges: 1.8, 3.5, 5, 7, 10, 14, 18, 21, 24, 26-30 MHz.
- Attenuator -16dB
- Receiver preamplifier +16dB
- Operating modes: LSB, USB, CW, AM (reception only), DIGI.
- Manual and electronic telegraph key (Straight Key, Jambic key or Single Paddle Key).
- Transmission activation by pressing the telegraph key (auto transmission).
- Adjustable delay to receive (when CW auto transmission is on)
- Adjust the speed of the electronic key.
- Enable CW self-monitoring mode.
- Enable SSB self-monitoring.
- Receiver detuning with transmitter (CW SHIFT) 0–1500 Hz. with a step of 100 Hz.
- SPLIT mode.
- Audio input selection mode, microphone or linear.
- Adjust the microphone input gain.
- Line Gain Adjustment.
- Three band microphone equalizer.
- Three AGC modes: Fast, Medium, Slow, Disabled.
- Adjust the display brightness. (10-100).
- Auto-dim mode when idle. (30s.)
- Impulse noise filter.
- Automatic notch filter
- Enable sound confirmation of pressing the control buttons.
- The ability to control the transceiver via CAT protocol (Kenwood TS-440) via USB port.
- Indication of the received signal level from S1 to s + 60dB (S-Meter).
- Select the display of the signal spectrum or waterfall.
- Power supply voltage indication.
- Indication of transmitter output power (Power Meter).
- Indication of VSWR value (SWR Meter).
- Transmit tone to tune the antenna tuner, amplifier.

➤ Additionally:

The transceiver is controlled by six buttons plus two buttons on the encoder volume and frequency settings, which are located on the front panel of the transceiver. A 1.3 "color IPS display is also located there.

*On the rear panel of the transceiver there are 9 connectors and a power switch...*

- Antenna connector (BNC).
- Power socket (5mm power jack).
- Jack for connecting a USB cable (Mini USB).
- Line in (3.5mm stereo Jack).
- Line out (3.5mm stereo Jack).
- Microphone (3.5mm stereo Jack).
- CW key (3.5mm 4pin Jack).
- External speaker (3.5mm mono Jack).
- Output for controlling an external amplifier (3.5mm mono Jack).

**Transceiver control:**

All controls are located on the front panel of the transceiver.

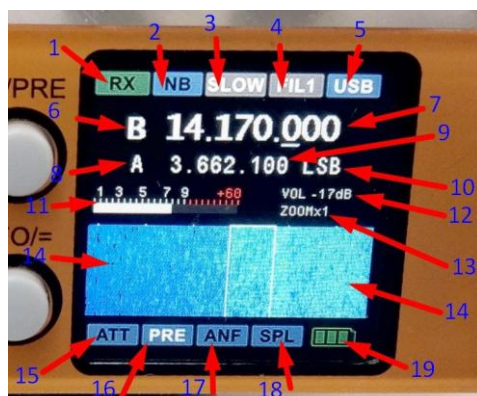
In order to preserve the small dimensions of the case and expand the functionality of the device, we tried to use a minimum of buttons, assigning them several functions that are switched depending on pressing, short or held.



1. Volume control. Pressing the knob will turn on the automatic notch filter to cut out the interfering tone when receiving stations. In transmission mode, the volume of self-control is adjusted.
2. Mode range selection (short press).
3. Select the type of work, press the button to select one of the types of work LSB / USB / CW / AM / DIGI.
4. Switching the receiving low-pass filter (short press). Entry - exit to the menu (entry - Press with a hold for more than 0.4 seconds, exit - a short press).
5. Selecting AGC-FAST / MID / SLOW AGC mode (short press). AGC-OFF (Press and hold for more than 0.4 seconds). Pressing this button in transmit mode will turn on the tuning tone and hold TX, a second press will turn off the tone and remove it from the transmission.
6. Turning on/off the receiver preamplifier (short press). Attenuator (Pressing and holding more than 0.4 seconds).
7. Select VFO A or B (short press). VFO A = VFO B (Press and hold for more than 0.4 seconds).
8. Display.
9. Frequency knob, pressing the knob will switch the adjustment step (50Hz, 100Hz, 1kHz).

## Transceiver display:

All information about the current status of the transceiver is displayed on a 1.3" color IPS display.



1. Type of work, reception and transmission (RX / TX).
2. Indicator of the impulse noise suppressor mode activation.
3. Indicator of the AGC system mode.
4. Turn on indicator for one of the three receiver bandwidth filters.
5. Indication of the type of work (LSB / USB / CW / DIGI).
6. Active VFO
7. Indication of the current frequency of the active VFO transceiver.
8. Inactive VFO.
9. The frequency of the inactive VFO.
10. Type of radiation inactive VFO.
11. Received signal level indicator (S-Meter).
12. Speaker volume level indicator.
13. Indicator to increase the spectrum or waterfall
14. Spectrum or waterfall window
15. Attenuator Indicator
16. Indicator receiver preamplifier.
17. Automatic notch filter indicator.
18. SPLIT feature indicator
19. Power supply indicator. (| 9-10,5v. || 10.6-11.9v. ||| 12 -14th.).



1. Audio signal indicator.
2. Output power indicator.
3. SWR indicator.
4. Tone tune Indicator.

## Transceiver control:

- **Volume control:** Turn the volume knob clockwise to increase and counterclockwise to decrease the speaker volume. Press the knob to turn on the automatic notch filter, pressing it again will turn off the filter.
- **Transceiver operating frequency:** Rotate the encoder knob clockwise to increase the frequency and counterclockwise to decrease the frequency. Press the encoder knob to switch the frequency step.
- **Band switching:** Press the “Band” button to select a band.
- **Selecting the type of radiation:** Press the “MODE” button to select the “LSB / USB / CW / AM / DIGI” mode.
- **Receiver bandwidth switching:** Press the “FL / MENU” button to select one of three filters you have preset.
- **Selecting the speed of the AGC system:** Press the “AGC” button to select the speed of the AGC system “FAST / MID / SLOW”. Press the hold button to turn off the AGC system.
- **Turning on the attenuator and preamplifier of the receiver:** Briefly press the “ATT / PRE” button to turn off the attenuator. Press and hold to turn on the receiver preamplifier.
- **Selecting a working VFO:** Press the “VFO / =” button to select VFO A or VFO B. Press and hold to copy the active VFO to an inactive one.

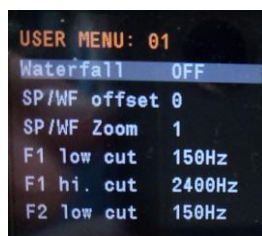
## User Menu:

To enter the menu, you must press and hold for 0.4 seconds. “FL / MENU” button

To exit the menu, you need to briefly press the same button again.

Rotating the encoder knob and pressing it, scrolls and adjusts menu items.

### ➤ *Menu items and operations with the:*



01. **Waterfall:** Turning off the waterfall, if the waterfall is off then there will be a spectrum on the screen.
02. **SP / WF offset:** Spectrum / waterfall sensitivity.
03. **SP / WF Zoom:** Spectrum / waterfall output scale. 1 = 14kHz. 2 = 7kHz.
04. **F1 low cut:** The first preset filter, cut from the bottom.
05. **F1 hi. Cut:** First preset filter, cut from above.
06. **F2 low cut:** The second preset filter, cut from the bottom.

USER MENU: 08	
F2 low cut	150Hz
F2 hi. cut	2800Hz
F3 low cut	100Hz
F3 hi. cut	3200Hz
NB	OFF
Split	OFF

07. **F2 hi. Cut**: The second preset filter, cut from above.
08. **F3 low cut**: Third preset filter, cut from below.
09. **F3 hi. Cut**: Third preset filter, cut from above.
10. **NB**: Enable impulse noise filter.
11. **Split**: Turns on the “Split” system.

USER MENU: 13	
Split	OFF
Tuning Step	1000Hz
TX Input	MIC
Input gain	3
MIC gain	13
MIC low cut	150Hz

12. **Tuning Step**: Choosing a frequency tuning step
13. **TX Input**: Select audio input, microphone or line input.
14. **Input gain**: Adjusts the gain of the line input.
15. **MIC gain**: Adjusts the gain of the mic input.
16. **MIC low cut**: The bottom cut of the microphone filter.

USER MENU: 18	
MIC low cut	150Hz
MIC hi. cut	2700Hz
MIC Eq	OFF
Eq Low	0dB
Eq Mid	4dB
Eq High	2dB

17. **MIC hi. cut**: The top cut of the microphone filter.
18. **Mic Eq**: Turns on the microphone equalizer.
19. **Mic Low**: Equalizer, low pass filter.
20. **Mic Mid**: Equalizer, midrange filter.
21. **Mic High**: Equalizer, high pass filter.

USER MENU: 23	
Eq High	2dB
Self control	OFF
Beeper	ON
Auto Bright	OFF
Brightness	10
Screensaver	ON

22. **Self control**: Enable “SSB” self control.
23. **Beeper**: Enable audible confirmation of button presses.
24. **Auto Bright**: Automatically dim the display when idle.
25. **Brightness**: Adjust the display brightness.
26. **Screensaver**: Turns on the screen saver when the transceiver is turned on.

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USER MENU: 27
Self control OFF
Beeper      ON
Auto Bright OFF
Brightness  10
Screensaver ON
PWR RAW     2472

```

27. **PWR RAW**: The ADC value of the transmitter power meter. (Engineering menu item).

➤ *In CW mode there is another menu.*

```

CW MENU: 01
Waterfall   OFF
SP/WF offset 0
SP/WF Zoom  1
Key trainer OFF
Key Type    Iambic
Key WPM     11

```

01. **Waterfall**: Turning off the waterfall, if the waterfall is turned off then there will be a spectrum on the screen.
02. **SP / WF offset**: Spectrum / waterfall sensitivity.
03. **SP / WF Zoom**: Spectrum / waterfall output scale. 1 = 14kHz. 2 = 7kHz.
04. **Key trainer**: The inclusion of training mode, in this mode, the transfer will not be included.
05. **Key Type**: Select the type of the telegraph key.
06. **Key WPM**: Telegraph Key Speed.

```

CW MENU: 08
Key WPM     11
Split       OFF
RX Shift    0700Hz
F1 w. band  500Hz
F2 w. band  800Hz
TX Delay    0300ms

```

07. **Split**: Enable the “Split” mode.
08. **RX Shift**: Receiver frequency offsets relative to transmit frequency (usually 700 Hz.).
09. **F1 w. band**: The first presetting of the telegraph filter.
10. **F2 w. band**: The second presetting of the telegraph filter.
11. **TX Delay**: Transmission delay after key release.

```

CW MENU: 13
RX Shift    0700Hz
F1 w. band  500Hz
F2 w. band  800Hz
TX Delay    0300ms
Self Control ON
Reverse Key  OFF

```

12. **Self Control**: Enable CW self control.
13. **Reverse Key**: Reverse dash pins and telegraph key points.



### **LSB / USB microphone operation:**

Connect the antenna to the “Antenna” connector. Plug the headset into the “Handset” jack. Connect a 13.8 volt power supply to the “Power” connector. Make the settings and volume you need. Press the PTT button to speak, release to listen.

If you are using a microphone, set menu 13 “TX Input” to “Mic”

If you plan to use other sound sources, for example, a sound processor, you can connect your sound source to the transceiver's line input. To do this, set the menu value to “Line”

### **CW mode operation:**

Connect the antenna to the “Antenna” connector. Connect the telegraph manipulator to the “CW Key” connector. Connect a 13.8 volt power supply to the “Power” connector. Make the settings and volume you need. Click on the key to work.

### **CAT Transceiver Control:**

Connect the USB cable to the computer and transceiver to control the transceiver from your software.

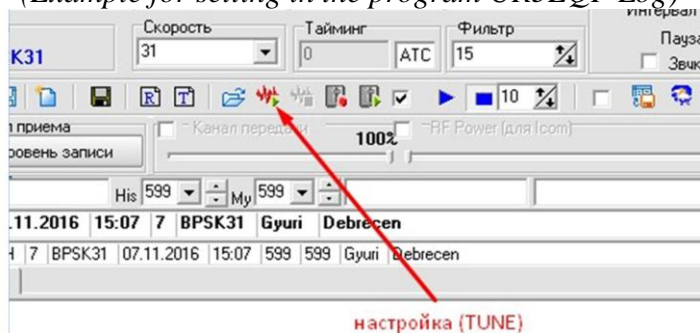
### **Work in digital forms “DIGY”:**

Connect the antenna to the “Antenna” connector. Connect the computer's audio output to the transceiver's “Line Input” jack.

Connect the audio input of the computer sound card to the “Line Output” jack of the transceiver, and the audio output of the computer sound card to the “Line Input” jack of the transceiver. Connect a 13.8 volt power supply to the “Power” jack and turn on the transceiver with a switch on the back of the transceiver. Make the settings you need in the transceiver and computer software.

- Turn on the “Tune” mode in your program for working in digital modes of communication.

(Example for setting in the program UR5EQF Log)



- ✓ Adjust the audio level of your sound card and monitor the transceiver output power using the output power indicator, make the output power slightly lower than the maximum value.

## Connecting external peripherals to the transceiver:

On the back of the transceiver are the following jacks for connecting peripherals ...



1. Power supply socket (Power Plug 5 mm.).
2. Power switch
3. Mini USB socket for CAT connection.
4. Line in (Stereo Jack 3.5mm).
5. Line Out (Stereo Jack 3.5mm).
6. Microphone input and PTT (Stereo Jack 3.5mm).
7. Jack to control external power amplifier (open collector)
8. Input for connecting the telegraph key (Stereo Jack 3.5mm).
9. An exit for connection of an external loudspeaker (Mono Jack 3.5mm).
10. BNC type connector, for connecting an antenna (50 Ohm).

### ➤ *Product version*

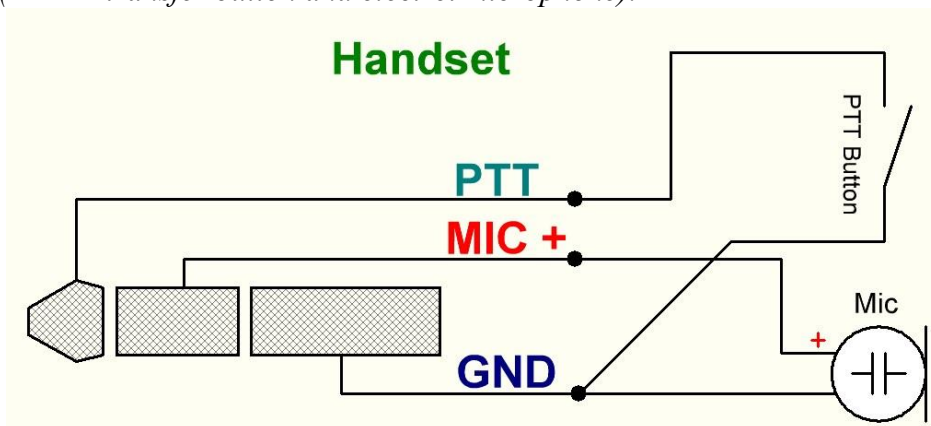
In order to find out the product version, enter the menu and press the "BAND" button  
A screen with product information will open.



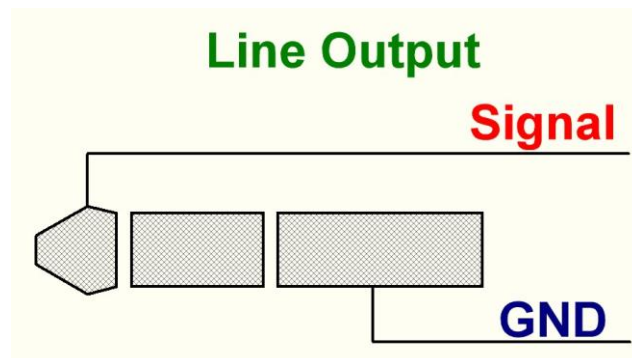
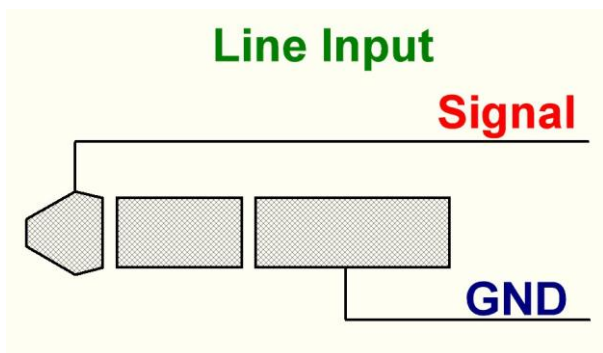
## Pinout connectors for external peripherals

### ➤ Handset Connectors:

Headset connection (“PTT” transfer button and electret microphone).

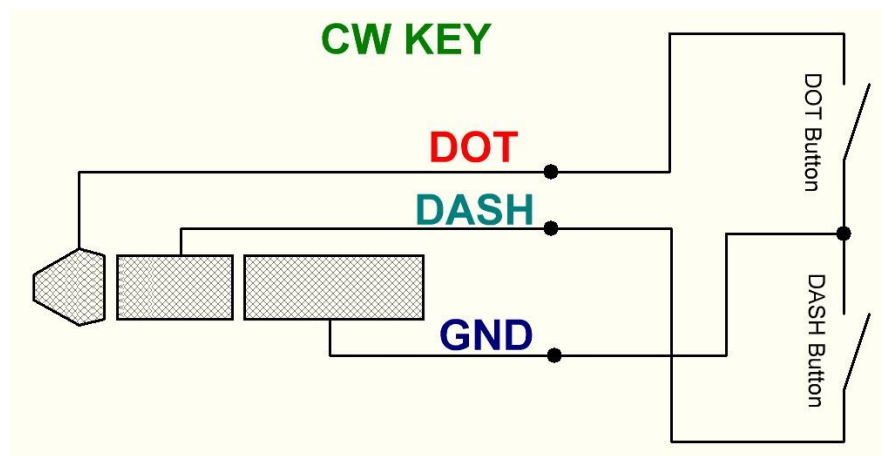


### ➤ Line Input/Output Connectors:



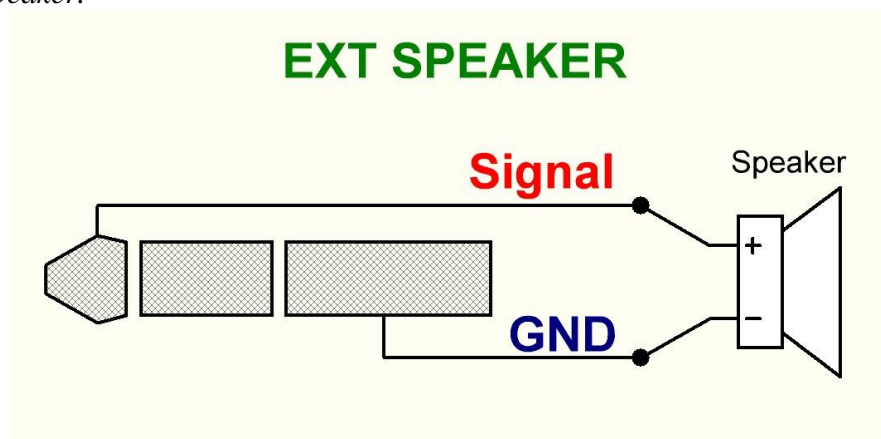
### ➤ CW-KEY Connectors:

Telegraph key connection (In the vertical key mode, the DOT contact is used).



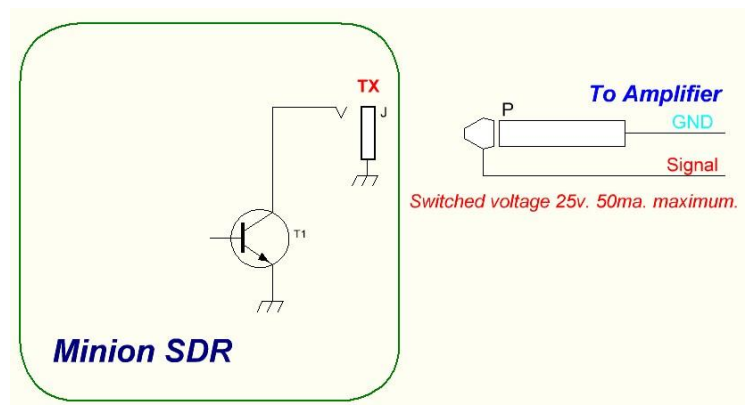
➤ **SP Connectors:**

Connect an external speaker.

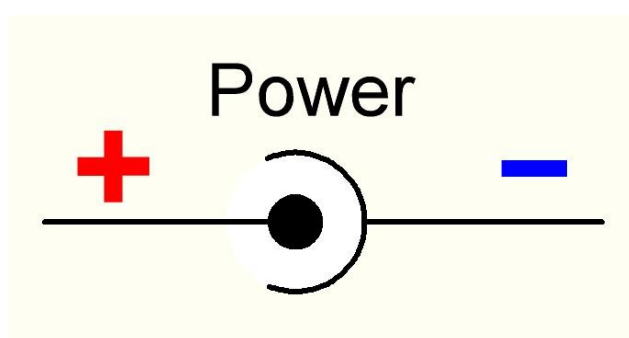


➤ **TX Connectors:**

Contact for controlling an external power amplifier.



➤ **Power Connectors:**



✓ *Notes:*

In the concept and appearance of the device, there may be some differences from a particular instance of the device that do not affect or impair its performance.



*Contacts:*

Web Sites: <http://qrpver.com>

E-mail: [support@qrpver.com](mailto:support@qrpver.com)

Our google group: <https://qrpver.com/ru/qrpver-group?place=contactowner%2Fqrpver-electronics>

**Best 73!**