

# RigExpert<sup>®</sup> WTI-1 Wireless Transceiver Interface



## User's manual

Please read this manual before  
attempting to use  
the RigExpert WTI-1 device.

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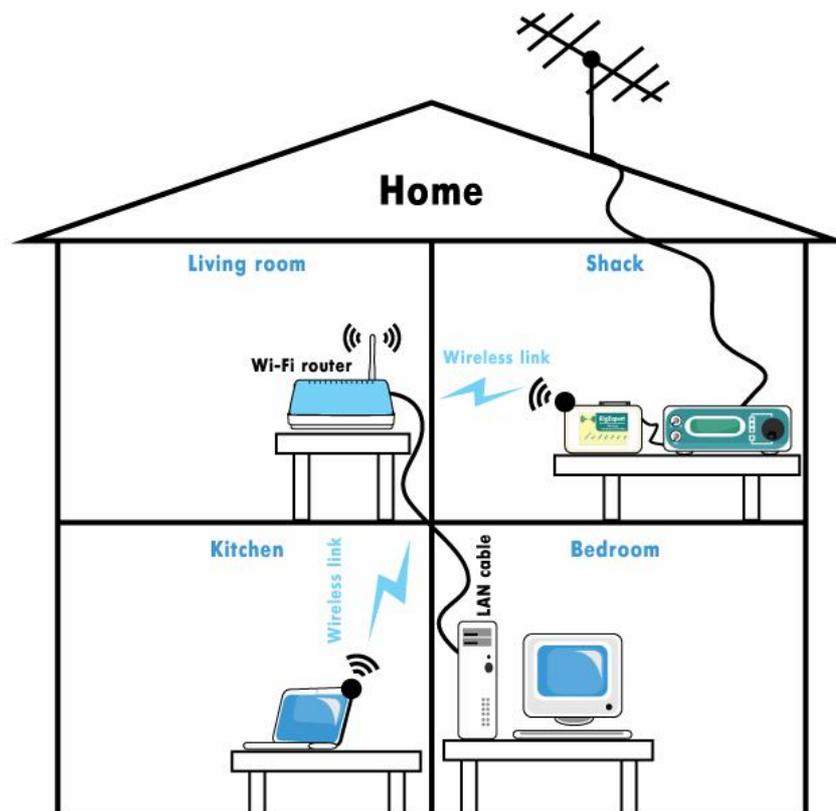
# 1. Description

## *General purpose*

The RigExpert WTI-1 transceiver interface is designed to operate voice, CW and digital modes from a computer in a local Wi-Fi network or via the Internet. The WTI-1 is irreplaceable for the following purposes:

- to operate your transceiver from another room of your house;
- to operate from another city or country;
- to share your rig with your friends;
- to be able to install your antenna at a remote location, if you are unable to do this at home for some reason.

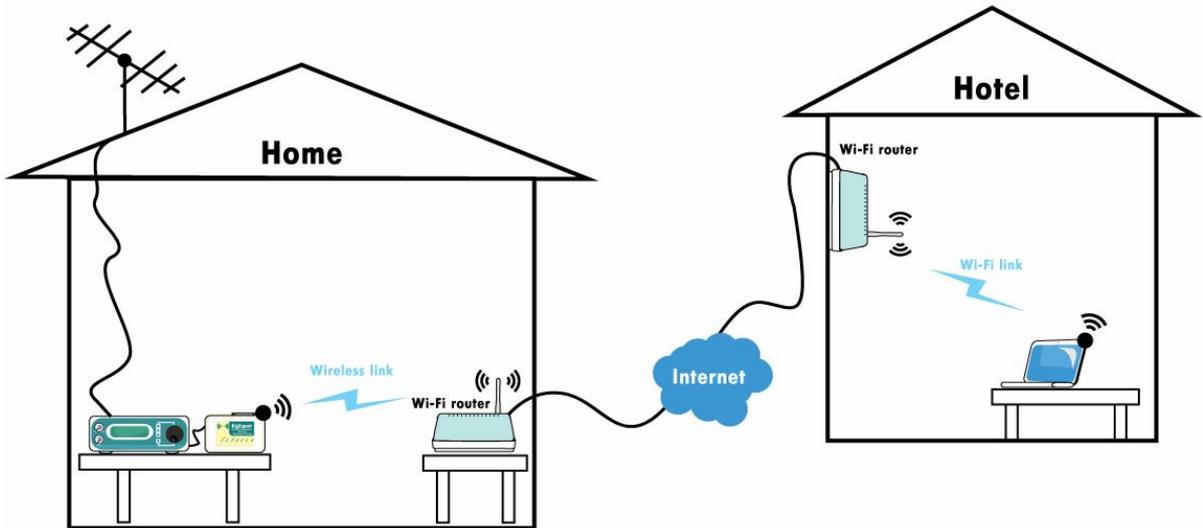
## *Operating in a local network*



The RigExpert WTI-1 gives you freedom to move around: now you do not need to stay in your shack all the time. You can operate from any place of your house or apartment where you have access to your local network. The WTI-1, connected to your transceiver, links to your Wi-Fi router or access point. You will only need a

laptop or a desktop computer running a ShackLink program and a conventional computer headset to operate voice. In addition, your favourite radio amateur software may be used for CW and digital modes, as well as to control your transceiver.

### ***Operate via the Internet***



You may also operate from any place in the world where you have access to the Internet, such as a hotel room. A high-speed (ADSL or faster) Internet connection is required.

Notice: It is necessary that you have a routable (or “public” or “external”) IP address (either static or dynamic) at a place where your WTI-1 is installed.

## 2. Specifications

- General features

Wireless transceiver audio interface for operating digital modes, voice recording and playback via local Wi-Fi network or Internet

CAT (Computer Aided Transceiver) system

FSK output

PTT and CW outputs

- Computer connection

USB (Universal Serial Bus) connector (only for first-time configuration)

Via a Wi-Fi network (2.4 GHz, “b” or “g”)

Powered from the transceiver’s power supply or an external DC source (9...15V, 500mA)

- Audio interface

Insulated from digital nets  
Maximum input/output amplitude is 1V

Input/output samplerate: 12kHz

True 16-bit DAC/ADC used

Volume levels are adjusted by the controls in ShackLink application

- Transceiver connection

Single 25-pin connector for transceiver cable

Various transceiver models supported

- CAT serial port

Baudrate: 300-115200 baud

Electrical compatibility: RS-232, CI-V, TTL or inverted-TTL (Yaesu, Icom, Kenwood, Ten-Tec, Elecraft and JRC transceivers)

- PTT/CW outputs

PTT output: open collector and TTL-level

CW output: open collector

Maximum current is 500 mA

- FSK output

Baudrate: 45-1200 baud

Open collector output

- System requirements

Desktop or laptop computer with USB 1/2/3 compliant port

Windows 2000/XP/2003/Vista/7/8 (32 or 64-bit) operating system

No USB drivers required

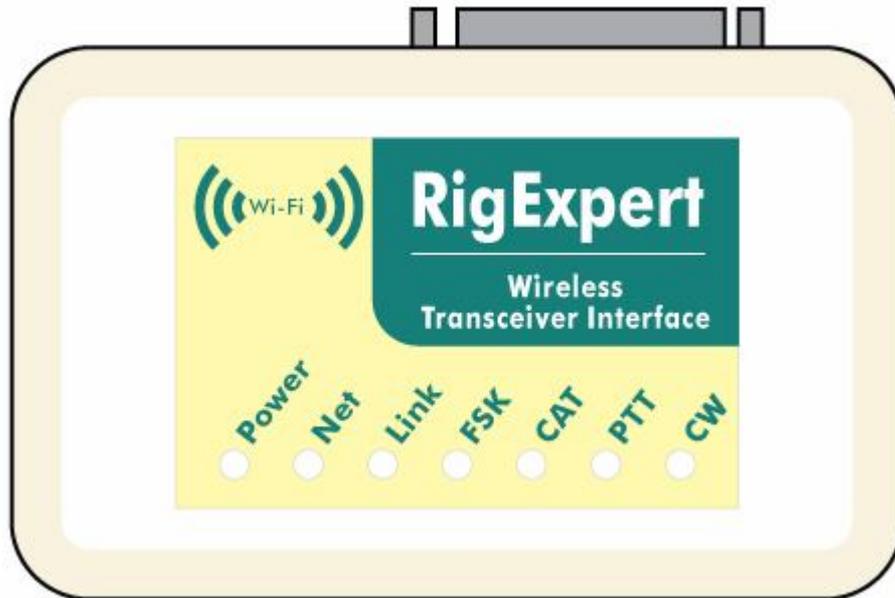
- The RigExpert WTI-1 software is provided free of charge

Dimensions: 117 x 80 x 23 mm

Weight: 0.16 kg

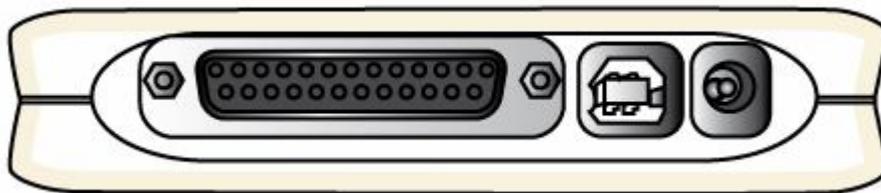
### 3. Hardware description

#### *Top panel*

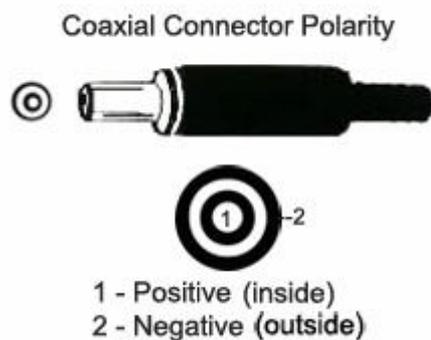


- “Power” – this LED lights when the RigExpert WTI-1 device is power on
- “Net” – blinks when WTI tries to find a Wi-Fi network. Lights when the WTI-1 has successfully connected to the Wi-Fi network
- “Link” – lights when the ShackLink application is connected to the WTI-1
- “FSK” – lights when the RigExpert WTI-1 is sending FSK data
- “CAT” – monitors CAT data exchange between your transceiver and your computer
- “PTT” – indicates when the transceiver transmits
- “CW” – shows transmissions in CW mode

## Rear panel



- 25-pin transceiver connector (a specialized cable compatible to all RigExpert interfaces may be used to connect your WTI-1 to your transceiver)
- USB connector to plug your WTI-1 to the computer's USB port for the first time configuration
- Power jack for connecting to the transceiver's power supply (13.8V DC) or an external DC power supply (9...15 V, 500mA)



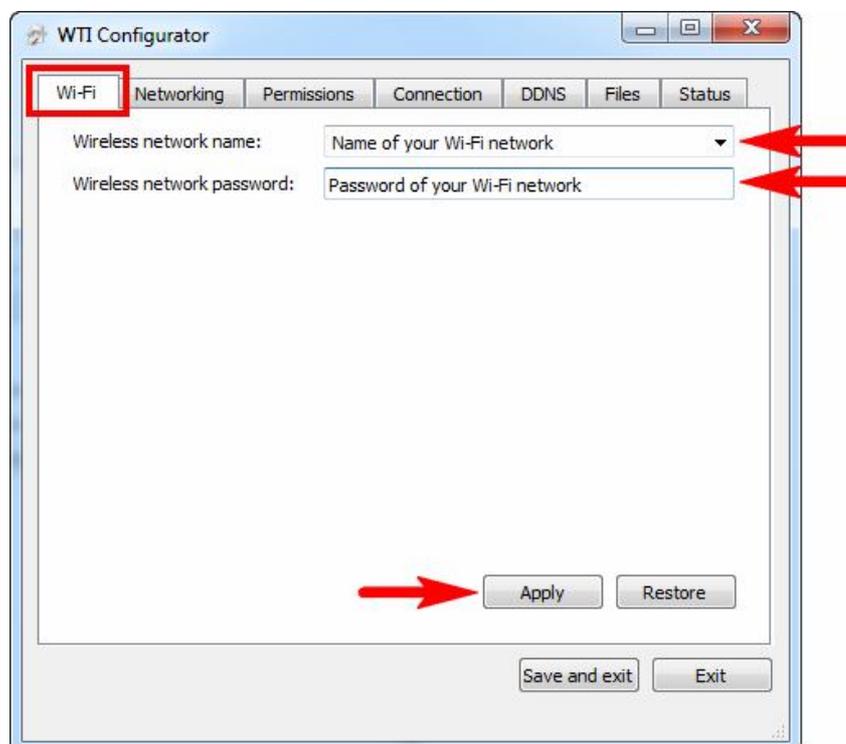
## 4. Initial configuration of your WTI-1

### Connecting your WTI-1 to a Wi-Fi network

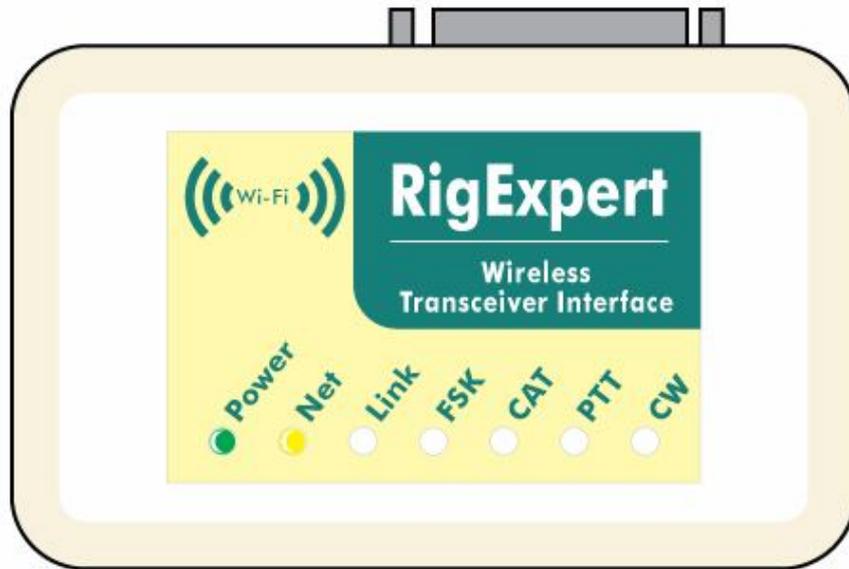
Run the “WTI Setup” file to install the necessary software on your PC (the latest version can be downloaded from the [www.rigexpert.com](http://www.rigexpert.com) website). Connect your WTI-1 interface to your PC using a USB cable and run the “WTI Configurator” program (Start → All Programs → RigExpert WTI → WTI Configurator).

*Notice: It is recommended to update your WTI interface with the latest firmware, which can be found at the Downloads section of our website, [www.rigexpert.com](http://www.rigexpert.com). Update the firmware by using the WTI Configurator utility (see the Files tab).*

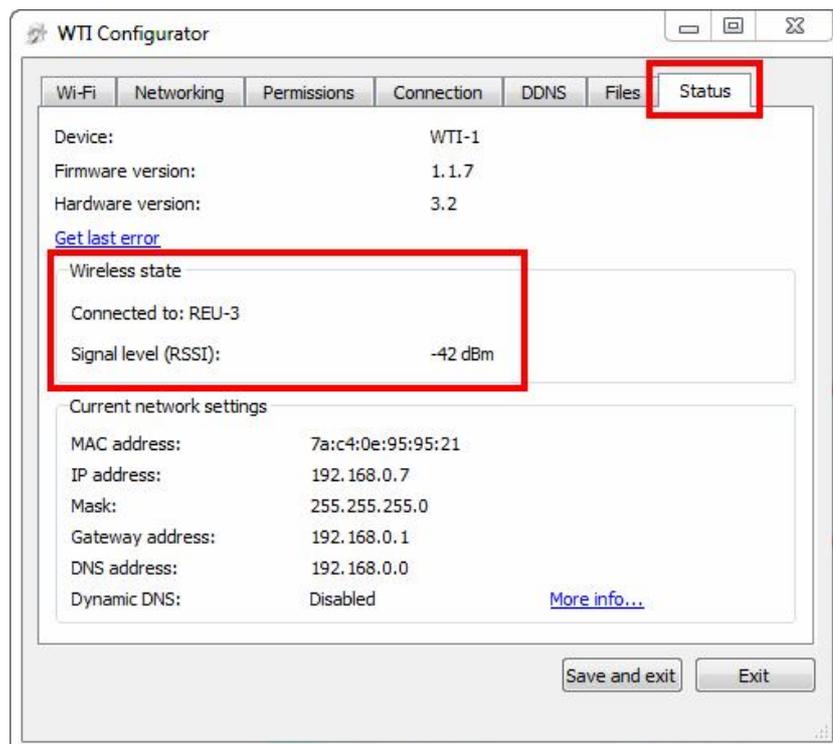
On the Wi-Fi tab, enter a name of your Wi-Fi network, as well as a network password, and press Apply. (*Instead of a Wi-Fi network name, you may enter the MAC address of a specific wireless router, such as 4C-0F-11-01-17-F2.*)



Make sure that your WTI-1 is connected to your wireless access point or wireless router. The “Net” LED should light:



Choose the Status tab and make sure that WTI has established a connection with your wireless network (you will also be able to see a level of the Wi-Fi signal):

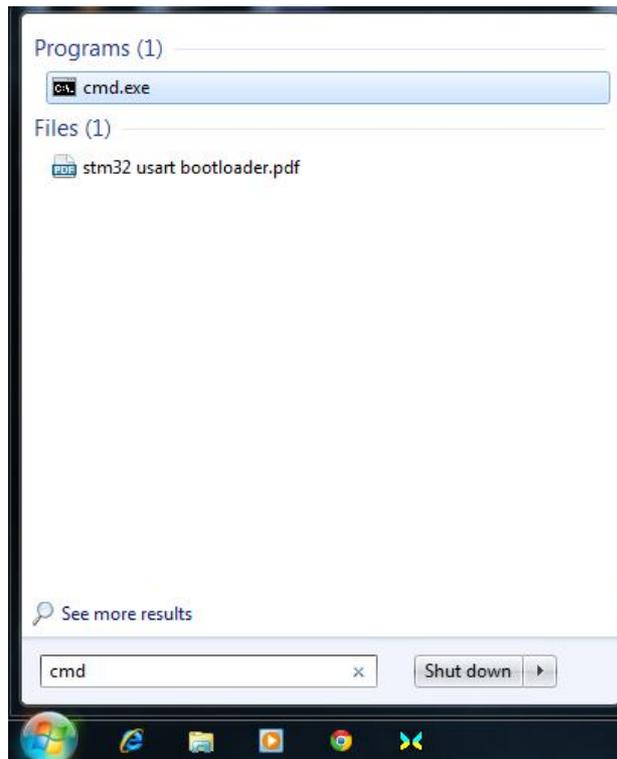


## Network IP settings

The default IP address of your WTI-1 is 192.168.0.10. The subnet mask is 255.255.255.0, and the gateway is 192.168.0.1.

These settings should be changed so to let you connect to the WTI-1 from another computer. You may find your network settings by using a method described below.

Open the Start menu, type “cmd” (without quotes) in the search line and then press Enter:



Click the “cmd.exe” line; a console window will open. Type “ipconfig” (without quotes) and press enter:

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Yuriy>ipconfig

Windows IP Configuration

Ethernet adapter Подключение по локальной сети 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . :

Wireless LAN adapter Беспроводное сетевое соединение:

    Connection-specific DNS Suffix . . :
    IPv4 Address . . . . . : 192.168.0.198
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

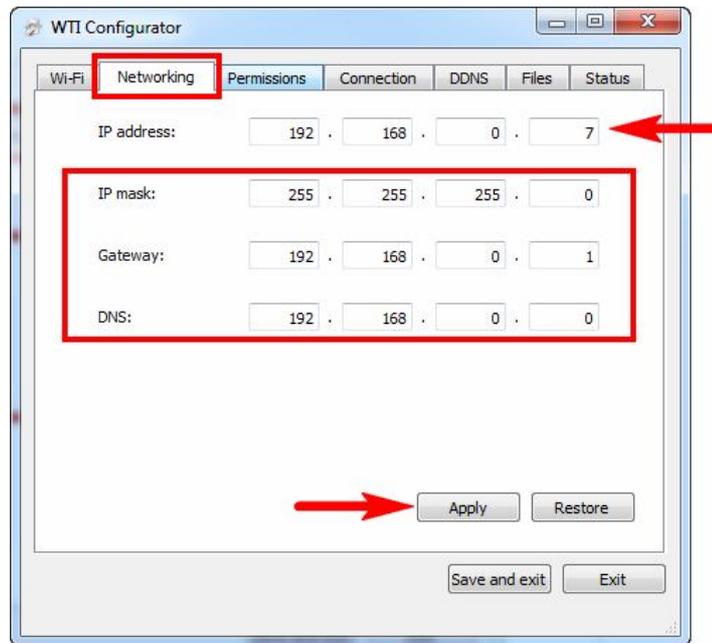
Ethernet adapter Подключение по локальной сети:

    Media State . . . . . : Media disconnected
```

In this example, the IP address of your PC is 192.168.0.198. This means that the IP address of your WTI-1 must range from 192.168.0.2 to 192.168.0.255. The Subnet Mask is 255.255.255.0 (should be the same for your WTI-1). The Default Gateway is 192.168.0.1 (should be the same for your WTI-1).

Use these settings to configure your WTI-1. In the WTI Configurator program, select the Networking tab and enter the following:

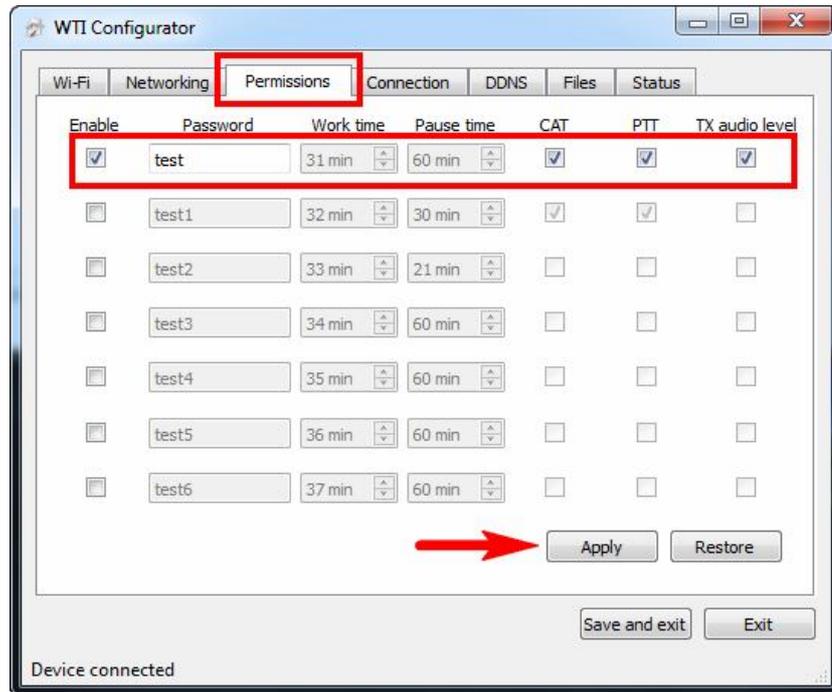
- IP address: copy the IP address of your PC, but change the last number (in this example, “7”). The IP address of your WTI-1 is now 192.168.0.7. Please notice that there should not be two devices with the same IP address in your local area network.
- IP mask and Gateway: copy from the settings of your PC.
- DNS: this address is usually the same as the Gateway IP address.



Press the Apply button to save these settings.

## Permission settings

In the WTI Configurator program, choose the Permissions tab:



There are seven user profiles supported by the WTI device. For each profile, enter a password, work and pause time, and user access rights.

In the **Password** field, enter a unique password for the specific user profile. The **Work time** will let you set how long the user can operate your WTI device continuously; the user then will have to wait the **Pause time**.

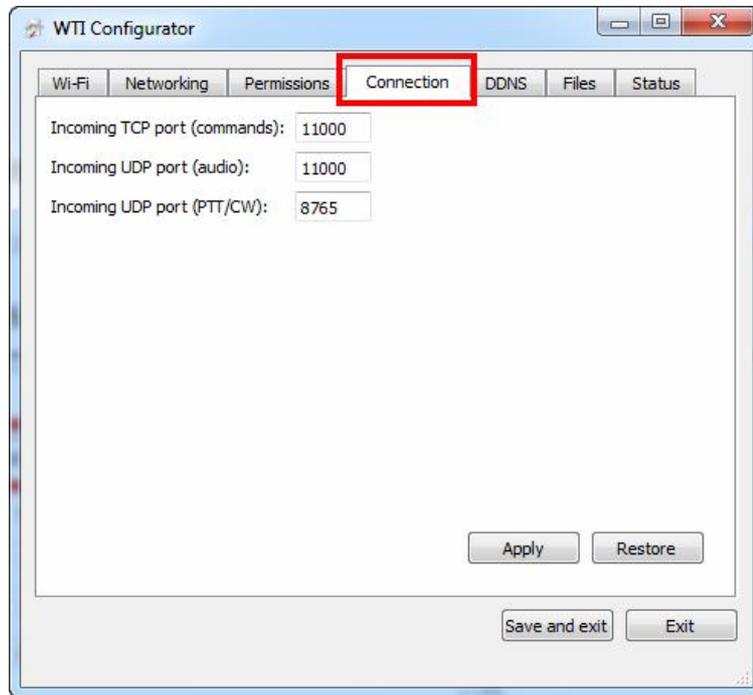
But checking/unchecking corresponding check boxes, edit user permissions, setting different access levels: enable/disable access to your transceiver's CAT system, PTT and audio TX level adjustment. If all three boxes are checked, full access to your WTI device is granted to a specific user.

Make sure the **Enable** check box is checked for the specific profile. Press the Apply button to apply settings.

*Notice: If you wish to allow another person (a friend) operate your WTI device via the Internet, it is recommended that you create a separate profile with limited permissions for this user.*

## Connection settings

In the WTI Configurator program, choose the Connection tab. If you need you can change numbers of network ports. In most cases, there is no need to change port numbers.



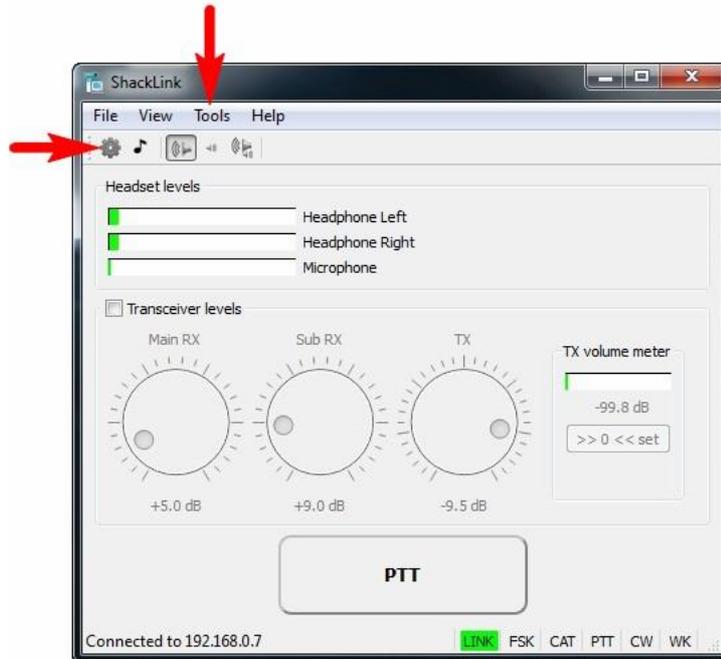
Click Apply and close the WTI Configurator program, then disconnect the USB cable. (Notice: the USB cable should be disconnected to allow operating your transceiver.)

Connect your WTI-1 to your transceiver and apply power to the interface. Make sure the WTI-1 has linked to the selected Wi-Fi network (the “Net” LED should light).

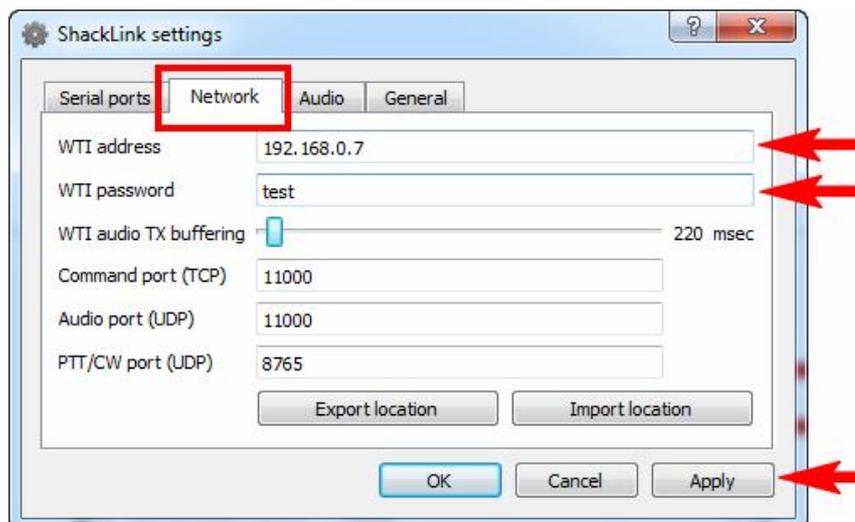
## 5. Configuring the ShackLink software

### IP settings

Run the ShackLink (Start → All Programs → RigExpert WTI → RigExpert ShackLink). Open the Tools → Settings menu (or click the gear icon):



Switch to the Network tab:



Type the IP address and the password of your WTI-1 interface to the same values as you previously entered in the WTI Configurator program.

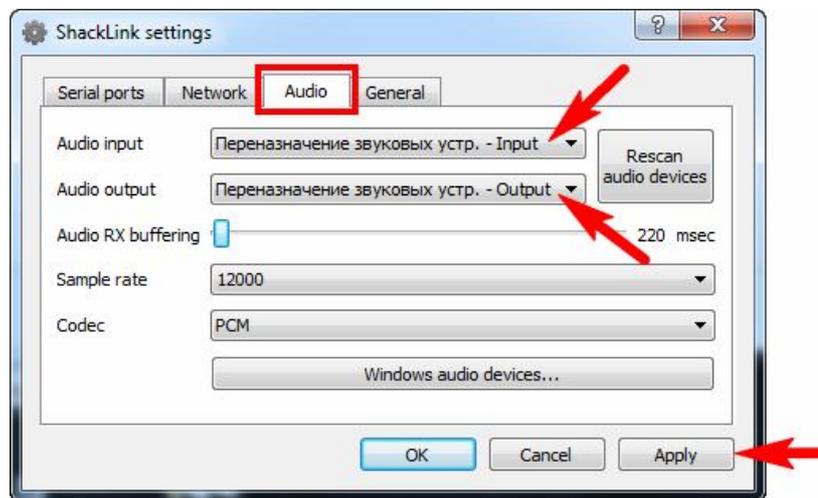
The “WTI audio TX buffering” parameter should normally be at a minimum. Increase this value when operating via the Internet.

Command Port (TCP), Audio port (UDP), PTT/CW port (UDP) – should be the same as you previously set in the WTI Configurator.

Press the Apply button when finished.

## Audio settings

In the ShackLink Settings window, choose the Audio tab. From the “Audio input” drop-down list, select a sound device your microphone is connected to:



From the “Audio output” drop-down list, select Speakers or Headphones.

Leave “Audio RX buffering” at a minimum level. Increase this value when operating via the Internet.

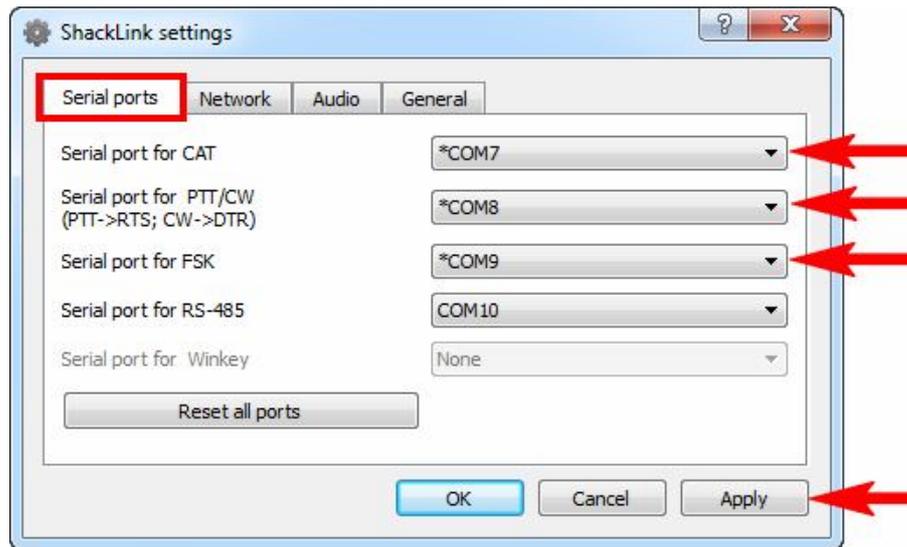
It is recommended to leave Sample rate and Codec parameters at their default values.

Please notice the “Windows audio devices...” button which opens the Windows configuration of audio devices to adjust output volume, microphone gain, etc.

Press Apply to continue.

## Configuring serial ports

Many third-party programs (such as MixW, Ham Radio Deluxe, DigiPan, FLdigi and others) communicate your radio via one or more serial ports to provide CAT system, PTT and CW switching, as well as the FSK output. The ShackLink program creates a number of virtual serial ports which may be configured at the Serial tab. Select virtual COM port numbers to be created for these functions:

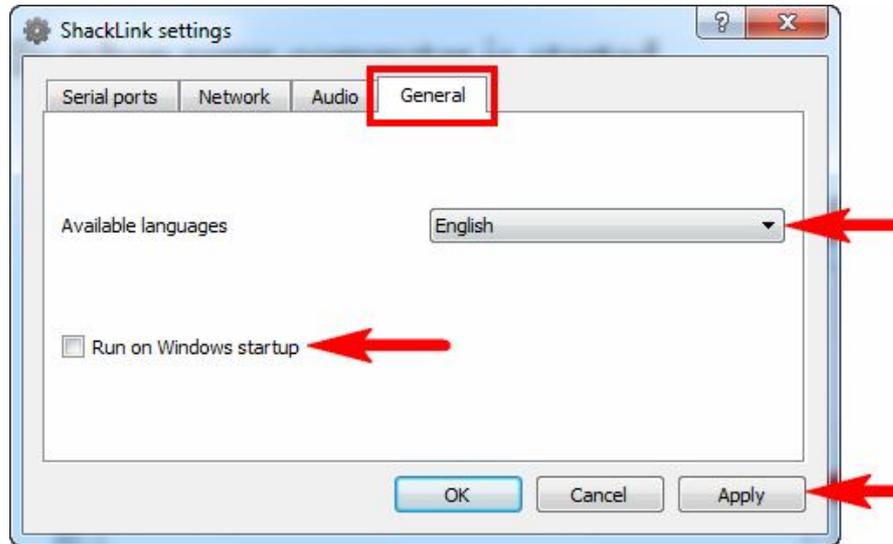


Please notice that some older third-party programs are only supporting port numbers less than COM10.

After pressing the Apply button, the settings are saved and the virtual serial ports are created.

## Other settings

Choose the General tab. You will be able to select the language used by the ShackLink program. Check the “Run on Windows startup” box if you wish to start the program automatically when your computer is started.



Press Apply to finish and then close the Settings window. Please notice that only one instance of the ShackLink can be running; close the program if you wish to access your WTI-1 from another computer.

## 6. Operating your WTI-1

The basic steps to operating your WTI-1 are described in short in the Quick Start Guide. This document covers setting up your transceiver's input and output levels, operating voice modes, as well as gives you a hint about setting up third-party software to control your rig, or to operate CW and digital modes.

Please also see other documents to learn more about:

- the detailed description of the ShackLink program;
- accessing your WTI-1 via the Internet connection;
- software setup examples of various third-party programs.

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