RigExpert WTI-1 Wireless Transceiver Interface

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The practice of controlling Amateur Radio stations over the Internet has been gaining in popularity in recent years. This has been driven largely by property restrictions that often make it next to impossible to erect a sizable antenna system — or any antenna system. In addition, we have substantial numbers of hams living in apartments, condominiums, and assisted living facilities where installing outdoor antennas may not be practical.

Fortunately, thanks to widespread Internet connectivity, antenna-compromised amateurs now have an alternative. They can establish stations at distant locations — locations free from antenna restrictions — and use the Internet to operate these stations remotely. The ARRL has even published a book on the topic: Remote Operating for Amateur Radio.

However, one of the complications involved in setting up a remote-control system is that not only do you need a computer at the operator’s location, you also need one at the remote site. The site computer provides the necessary link to the transceiver for control. It may also support a VoIP (Voice over Internet Protocol) application such as Skype to send audio back and forth.

This approach to remote hamming certainly works, and it is described in detail in Remote Operating for Amateur Radio, but having a full-fledged PC or Mac at the remote site adds a layer of complexity. Now you have a distant computer that is also vulnerable to software glitches, hard drive failures, and so on. A more efficient, reliable solution would be to remove the remote station site will need a wireless Internet connection. Imagine, for example, a small waterproof box at the remote site. Inside the box would be a compact transceiver, a power supply, and the WTI-1. The only connecting cables would be an ac power line from the home and the coaxial cable to the antenna. Assume that the WTI-1 is essentially a miniature computer dedicated to a single task: remote transceiver control. It connects to the keying and computer-control ports on the radio and in turn connects to the Internet via a wireless Wi-Fi link.

RigExpert offers a number of pre-wired cables for various transceivers to make the rig connection as simple as possible. For this review we used a Kenwood TS-2000 transceiver and purchased the appropriate cable from RigExpert. The WTI-1 also comes with a wall cube power supply, although you could also choose to run the unit from your own dc power source.

The WTI-1 provides complete transceiver control including audio. With the WTI-1 you won’t need separate hardware or software to operate phone or sound-device-based digital modes. The WTI-1 also supports FSK keying for RTTY and even CW operation. To send CW, you can use CW keyboard software at the operator end, or the operator can use any remote keyer with WinKey protocol. (A separate COM port is created in the system to support the WinKey data exchange.)

A remote station built around a RigExpert WTI-1 needs only three additional components: a transceiver, an antenna, and a wireless Internet connection. Imagine, for example, a small waterproof box at the remote site. Inside the box would be a compact transceiver, a power supply, and the WTI-1. The only connecting cables would be an ac power line from the home and the coaxial cable to the antenna. Assume that.

Installing the WTI-1

You need a computer to do the initial setup of the WTI-1, but you only need it once. The printed instructions that accompany the WTI-1 lead you through the steps.

The instructions notwithstanding, you’ll need to have a basic understanding of how ports function in computer systems (or you will need a friend who does). You must assign the WTI-1 ports for PTT keying, CAT (transceiver control), and so on. It is important to make note of these because the software at the operator’s end of the path will need to be configured to use these same ports.

Another critical aspect of installing the WTI-1 is the Internet connection. The remote station site will need a wireless access point, or more commonly, a wireless router. If you don’t understand how routers function, you may need assistance when configuring and testing the WTI-1.

In a nutshell, most homes use routers these days to distribute access to the Internet within a household network. As the name suggests, a router “routes” data to and from the Internet to various computers and devices. It can do this with wired connections, wirelessly (Wi-Fi), or both.

Many devices can connect to the router simultaneously (especially via the Wi-Fi connection) and this allows everyone in the home to use their desktops, tablets, laptops, and smartphones with ease. As far as the router is concerned, the WTI-1 is just another “smart device” on the network.

However, connecting to the WTI-1 (or any other device on the home network) from the outside world is not quite as straightforward as it may seem. Routers come equipped with firewalls to protect the home network from hackers and other ne’er-do-wells that inhabit the Internet. Devices on the home network can breach the firewall to reach the outside world as needed; many do this automatically in ways that are transparent to the users. But to communicate with the
WTI-1 you may need to access the home router and assign specific ports (yes, routers have ports too) for the traffic running to and from the device.

**Using the WTI-1**

The WTI-1 comes with a Windows application known as *ShackLink*. When installed on the operator’s computer, *ShackLink* communicates with the WTI-1 and manages the incoming and outgoing audio streams. It can also be used to key the transceiver.

For this review, I installed *ShackLink* on my office PC at ARRL Headquarters. I configured it to “look” for the WTI-1 at my home Internet address and use the home router ports that I specifically set up for the WTI-1.

The instant I double-clicked my mouse cursor on the *ShackLink* icon, the software opened a path to the Internet, sought out the WTI-1, and made the connection. Suddenly I had 40 meter audio blasting through my computer speakers (I had turned on the rig and tuned to the 40 meter phone band before leaving the house).

After plugging in a USB headset and reconfiguring *ShackLink* accordingly, it was a simple matter to make a brief phone QSO. All I had to do was click my mouse on *ShackLink*’s oversized PTT button whenever I wanted to transmit.

It is important to point out that you will still need a separate rig control application running at the operator’s location if you hope to tune the remote transceiver. This can be something as simple as the free DXLab *Commander* ([www.dxlabsuite.com/commander/](http://www.dxlabsuite.com/commander/)), or a more elaborate program such as *Ham Radio Deluxe* ([www.ham-radio-deluxe.com](http://www.ham-radio-deluxe.com)). The WTI-1 instructions include specifics on how to use the device with several popular programs.

I also used the WTI-1 to do a bit of remote digital hamming. I happened to have *Fldigi* on my office PC, so I used that program to control the transceiver frequency and operate PSK31. The only trick was sharing the audio data between *ShackLink* and *Fldigi*, but *ShackLink* has its own “virtual audio cables” to make this easy. The supplementary instructions detail how to do this for various software applications.

With *ShackLink* managing the connection to the WTI-1, I was able to spend a few lunch breaks making PSK31 contacts by remote control. With the exception of a couple of audio hiccups caused by the sheer volume of data traffic on the HQ network, the WTI-1’s performance was flawless. See Figure 5.

**An Easy Remote Solution**

Once you’re past the installation and testing phase, the RigExpert WTI-1 suddenly becomes “invisible.” That is to say, you forget that it is there. And why not? After all, the hallmark of reliability in a device of this type is that you never have to think about it. The WTI-1 does not require further attention beyond the initial setup; it simply works.

It is also worthwhile to note that “remote” doesn’t necessarily mean controlling a station that is many miles away. I enjoyed using the WTI-1 to operate my TS-2000 with my laptop computer while sitting out on the patio. If you’re in a situation where you need to conceal your radio in your home, this type of remote control may offer a unique solution.


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**Notes**