

Installation & Operation



- INTRODUCTION -

The SignalLink USB combines the legendary performance of our SL-1+ with a state of the art built-in low-noise sound card. This innovative design offers many advantages over traditional sound card interfaces that must use the computer's sound card. These include optimal performance, greatly simplified installation and operation, and the ability to easily run multiple interfaces on one computer at the same time.

The SignalLink USB supports virtually all sound card Digital and voice modes. This includes ölegacyö modes such as RTTY, SSTV and CW, as well as today's most popular modes like PSK31, JT65, WINMOR and EchoLink. Performance on all modes has been optimized by the use of special low-noise parts and careful design techniques, while convenient front panel controls let you adjust your Transmit Audio, Receive Audio and Transmit delay "on the fly".

The SignalLink USB is designed and manufactured using only the highest quality components. Assembly is done using state-of-the-art robotic production equipment. Strict testing of every unit, and our high level of quality control insures you of a premium quality product that will provide many years of dependable service. A great deal of effort has gone into the design and manufacture of the SignalLink USB, and we think you'll agree that we have offered a level of innovation, quality, and value that cannot be beat!

- INSTALLATION OVERVIEW -

The SignalLink USB is easy to install and operate. However, if it is not installed and operated correctly, you will not realize its best performance and in extreme cases you can damage your other equipment. Therefore, it is very important that you take the time to read these installation instructions carefully to avoid any possible problems.

The SignalLink USB will be installed in a few simple steps. First, you will configure it for use with your radio by installing one of our optional Plug & Play Jumper Modules, or the supplied jumper wires inside the unit. Next, you will connect the SignalLink USB to your radio and then to your computer's USB port which will automatically start the driver installation. Once the driver installation has been completed you will configure Windows and the communication program, and then verify that your radio is setup properly. You'll then be ready to get on the air. If after completing the installation you have any difficulty, please refer to the öTroubleshootingö section at the end of this manual. It covers most of the common problems that you might run into. Technical Support for the SignalLink is also available if you need it. Please see the öTechnical Supportö section of this manual for more information.

- WHAT YOU WILL NEED -

The SignalLink USB is supplied with everything needed to connect it to your computer and radio. If you choose to configure your SignalLink with the supplied jumper wires instead of one of our optional jumper modules, then you may find a pair of needle-nosed pliers to be helpful. If the jumper settings for your radio are not available on our web site or CD, then you will need a multi-meter to verify your radio wiring. You will need a communication program for testing when the installation is complete. We have supplied some of the most popular programs for the most popular modes on our software CD. You can also download additional software from the SignalLink Software page of our website at www.tigertronics.com.

- OPENING THE SIGNALLINK USB CASE -

IMPORTANT – To reduce the risk of damage by static electricity, we strongly suggest grounding yourself with an anti-static wrist strap before opening the SignalLink's case. If you don't have a wrist strap available, then you can drain any static buildup that may be present by momentarily touching your computer or radio chassis (or other grounded metal object). If you're going to be moving around or getting out of your chair during the installation, then you should repeat this before touching the SignalLink.

To open the SignalLink USB, you will need to open the *front* of the unit while leaving the three knobs attached. This can be done by removing the four front Allen screws with the supplied Allen wrench, and **CAREFULLY** sliding the circuit

board and front cover forward. **To avoid damaging the SignalLink's front panel controls, we strongly suggest that you sit the circuit board on a book or other raised insulated surface when installing the jumper wires or jumper module. The front panel should hang off the raised surface so no pressure is put on it.** When you have completed the installation steps below and are ready to re-assemble the SignalLink USB, **CAREFULLY** slide the circuit board back into the case making sure that all connectors on the back of the board fit into the rear plastic panel properly (note that the circuit board sits on the bottom most rail). The front panel should align nicely with the front of the case and snap into place with very little pressure. If everything looks good, then re-install the four Allen screws. They should be snug. Do not over-tighten them or you may damage the plastic panel. If you have any difficulty re-installing the circuit board, you can remove the rear panel to make it easier.

- CONFIGURING THE SIGNALINK -

CAUTION – Before connecting the SignalLink to your computer or radio, please read this entire section thoroughly. Both the SignalLink and your radio can be damaged by improper installation. If you have already attached the SignalLink to the computer or radio, then you will need to unplug those cables BEFORE installing the jumper module or jumper wires.

The SignalLink USB attaches to the radio through the “Radio” connector located on the rear of the unit. This connector brings all of the required radio lines into the SignalLink USB so that each line can be connected to the appropriate matching line inside the SignalLink. The SignalLink USB uses the radio’s Ground, PTT, Speaker and Mic lines (or the equivalent signals if using a Data or Accy Port). Because the location of these signals on the radio connector varies from radio to radio, we have provided a “Programming Socket” inside the SignalLink. See “JP1” in Figure 4 (page 8) for the location of this socket. The JP1 Programming Socket provides a convenient way to route the various signals to the correct pins on the radio connector. This is accomplished with either an optional jumper module, or the supplied “press-in” jumper wires. In either case, no soldering is required.

Installing a Plug & Play Jumper Module

If you have purchased one of our optional jumper modules, then you will be installing it inside the SignalLink instead of the jumper wires. To install the jumper module, carefully remove it from its protective plastic box and foam. Place it lightly on the SignalLink’s JP1 jumper socket being careful to align the notch on the jumper module (white board outline) with the notch on the SignalLink’s circuit board (white outline around the JP1 jumper socket). **Be sure that the module is aligned with the socket notch to notch.** Carefully look at each pin to make sure that all pins are centered in the socket holes, and then gently press down evenly on the module until it is seated securely in the socket. If your jumper module has any configuration jumpers on top of the module (some do), then be careful not

to push on them when installing the module into the socket. Also, you will need to see the Jumper Module page of our website at www.tigertronics.com/slmodules.htm to see if any of the jumpers need to be enabled for your radio. Be sure to check the above link if you have these on your jumper module, or you may be unable to transmit or receive.

Once you are confident that the jumper module is installed and configured correctly, you can put the SignalLink USB circuit board back into the case (see “Opening The SignalLink Case” at the beginning of this manual) and skip to the “Connecting the Radio” section below.

Installing Jumper Wires

NOTE: The SignalLink USB NEVER needs external power, so the JP1 socket does NOT have a “PWR” pin like earlier SignalLink models. When installing the jumpers for the SignalLink USB, you can disregard the “PWR” jumper that is sometimes shown in our documentation. All other jumpers should be installed as indicated.

Jumper settings for most common radios are provided on the SignalLink CD and on the Jumper Settings page of our website. Some of our radio cables also include a printed document showing the required jumper settings. If jumper settings were supplied with your radio cable, then you should install the jumpers as shown on that document. If your cable did not include jumper settings, then please check the “Jumper Settings” section of the SignalLink CD or our web site at http://www.tigertronics.com/sl_wire.htm. If you find the settings for your radio listed there, then please double-check that you are looking at the correct radio model and cable type (some radio’s have multiple cabling options). If we do not have the jumper settings for your radio connection available, then you can follow the “Detailed Jumper Installation Procedure” on our website at http://www.tigertronics.com/files/signalink_jumper_procedure.pdf, or send us a request for the jumper settings through our website at <http://www.tigertronics.com/email.htm>. Please note that we will need the pin-out and connector type information from your radio manual in order to help you.

We have provided pre-stripped jumper wires with the SignalLink USB. These wires are 24ga AWG and fit perfectly in the SignalLink’s jumper socket. **If you use any other wire to install the jumpers, the wire MUST be 24ga AWG, or you will damage the SignalLink’s socket.** Installation of the jumper wires can be done without any tools but you may find it easier to do with needle-nosed pliers. If you do use needle-nosed pliers, be sure to grip the wire close to the end that you are installing in the socket. When pushing the wires into the socket, push gently until the wire stops. Be very careful not to bend them back and forth or they might break. The wires are quite durable and can be removed and re-installed many times, if you are careful. If you break a wire off in the socket, there is no way to remove it, and you will have to have a new socket installed (not covered under warranty). This should not be an issue if you are just a little bit careful. Once you have all of the jumpers installed, please take a few minutes to look them over. The

jumper wires should be secure in the socket, with the same size gap between the socket and the insulation on each jumper wire. If you notice a larger gap on one or more wires, then that wire is probably not pushed-in securely.

As noted at the beginning of this section, the SignaLink USB doesn't use the PWR jumper, so it should not be installed. You should have the öSPKö jumper installed only if you have Speaker/RX audio available on the radio connector that you are using. If this signal isn't available (a possibility with Mic jacks ö Check your radio manual!), then this jumper should **NOT** be installed. Instead, you will need to connect the supplied audio cable as described below in the öConnecting The Radioö section. Once you are confident that the jumpers are installed correctly, you can put the SignaLink USB circuit board back into the case (see öOpening The SignaLink Caseö at the beginning of this manual).

- CONNECTING THE RADIO -

A radio cable with the appropriate connector for your radio was supplied with the SignaLink USB. The 8-pin modular end of this cable plugs into the SignaLink's RJ-45 öRADIOö connector, and the other end plugs into the radio's Mic, Data, or Accessory Port jack. Using your radio manual for reference, carefully identify the connector on the radio that the radio cable should be plugged into. For Mic cables, this connection is virtually always on the front of the radio, and there's generally only one öMicö connector. For Data or Accy Port cables, this connection is virtually always on the back of the radio. There is usually only one matching connector that the cable will plug into, however there are often many different connectors on the back of the radio so you'll need to look carefully. The connection used by the SignaLink is usually called something similar to öDataö or öAccyö, such as öACCö, öACC1ö, or öData/RTTYö, but it may also be called öPacketö. Note that connectors labeled öRTTYö are virtually always for FSK use only and will not work with the SignaLink. Similarly, jacks labeled as öDVS2ö, öRemoteö, öCATö, öBand Dataö and öPatchö serve other purposes and will not work with the SignaLink.

Once you have identified the correct connector on your radio, carefully align the plug on the cable with the socket on the radio, and push the plug in securely. Then, plug the RJ-45 end of the cable into the SignaLink's Radio connector.

NOTE: Most connectors are keyed to prevent incorrect insertion. However, it is still possible to install some incorrectly. 13-pin DIN connectors, for example, can often be plugged in exactly upside-down with just a little extra pressure. Please be sure to look carefully at the socket on the radio and the plug on the cable, and align the two properly. Do not use any markings (arrow, etc.) on the cable for alignment as they may not match the radio.

SPKR Audio Input Jack

The SignaLink USB has a öSPKRö audio input jack on the rear panel that can be connected to the radio's External

Speaker, Headphone, or other audio output jack, if this signal isn't available on the radio's Mic connector. Note that the SPKR jack is not normally used if the SignaLink is connected to the radio's Data or Accy Port since these connections always provide the RX Audio signal.

If the SignaLink is connected to your radio's Mic jack, then check your radio manual to see if the Speaker Audio signal is available there. It is generally labeled as öAF Outputö, öSpeakerö, or öRX Audioö. If the Speaker Audio signal *isn't* available on the Mic jack then you will need to connect the supplied audio cable between the SignaLink's SPKR jack and the radio's External Speaker or Headphone jack (a fixed level audio output can also be used with the appropriate user-supplied adapter). Be sure that the cable is plugged in securely on both ends (the plugs should snap in place).

NOTE: You should *NOT* connect the audio cable as described above if either of the following are true;

- Speaker Audio is available on the Mic jack and you have installed the SPK jumper wire inside the SignaLink's JPI socket, or enabled the SPKR jumper on the jumper module that you have plugged into the JPI socket.
- The SignaLink is connected to the radio's Data or Accy Port which already supplies the RX Audio signal.

AUX Audio Output Jack

The SignaLink USB has an Auxiliary Audio jack (öAuxö) on the rear panel that can be used to attach an external radio speaker, or headphones for monitoring receiver audio. This is especially useful if your radio's built-in speaker has been cut-off by a speaker/headphone connection to the SignaLink. Note that the Aux jack can only be used with a speaker/headphones if the SignaLink USB is connected to high-level Speaker audio. If the SignaLink USB is connected to your radio's Data or Accessory Port, then you will not be able to use this output for monitoring because virtually all of these ports have low-level outputs.

NOTE: Attaching or removing an external speaker while you are using the SignaLink USB will change the loading on the radio's speaker circuit. This will probably cause a change in the level of audio going to the SignaLink USB, and may require you to re-adjust the SignaLink's RX level control or the radio's Volume control to compensate

MON Audio Output Jack

The SignaLink USB has a Transmit Audio Monitor jack (öMonö) on the rear panel that can be used with amplified speakers or high-impedance headphones to monitor the SignaLink's Transmit Audio signal. The output level of this jack varies with the computer's software volume controls, and provides a maximum level of approximately 400mv p-p into 1Kohm. This is sufficient to drive most amplified speakers and high-impedance headphones, but not unamplified speakers.

NOTE: The Monitor output is not isolated from the computer, so it may be possible to hear low-level power supply hum or noise generated by the computer or amplified speakers. This is normal and is NOT an indication that your Transmit Audio is noisy. The actual Transmit Audio signal going to the radio is FULLY ISOLATED from the computer.

- CONNECTING THE COMPUTER -

IMPORTANT: You should connect the SignalLink USB to your computer only AFTER you have installed the jumper module or jumper wires, and connected the radio cable.

The SignalLink USB can be connected to any standard USB 1.1 or USB 2.0 port on your computer using the supplied USB cable. On desktop computers we recommend attaching the SignalLink to a rear panel USB port. This is because some front panel USB ports are not full USB ports and may be unable to provide sufficient power (this does not apply to laptops). External USB hubs, docking stations, and USB extension cables should also be avoided. If you must use a USB hub, then it must be externally powered and designed for high power USB devices.

Before attaching the USB cable, your Windows Operating System should be fully updated. The SignalLink should be turned OFF, your computer should be turned ON, and Windows should be running and sitting idle. All communication programs and other software should be closed. Your virus scanner should not be actively scanning.

We suggest that you plug the computer-end of the USB cable into the computer first, as this will help drain any static electricity off you and minimize the chance of static damage to the SignalLink. The computer end of the USB cable has a flat rectangular shaped type A plug and will fit into the USB jack only one way. If it doesn't plug in, then you have either turned it the wrong way, or you are trying to plug it into a non-USB jack. The SignalLink end of the cable can be plugged in after the connection to the computer has been made. This end of the cable has a USB type B connector and plugs into the SignalLink's rear panel USB jack. This connector is also keyed and will only fit one way.

When the USB connection between the SignalLink and the computer is made, Windows will automatically detect this and install the required drivers. Note that the SignalLink drivers are provided directly by the Windows Operating System. The SignalLink CD does **not** contain any drivers and it is **not** required for installation.

During this process (usually only a minute or two) you may see several "New Hardware Found" messages as the drivers are installed. Once the driver installation is completed your computer may display a message indicating that your new hardware is ready for use. Note that some computers will not display any "New Hardware Found" or "Hardware Ready for Use" messages. This does not indicate a problem, so please do not be alarmed.

Once the SignalLink USB drivers have been installed, you are now ready to configure Windows and the communication program. This is described in detail in the "Configuring Windows" section below.

IMPORTANT: If you move the SignalLink to a different USB port after you complete the Windows setup instructions below, then Windows will detect this and re-install the SignalLink drivers. Once the drivers have been reinstalled for the new port, you must go through the Windows setup instructions again or the SignalLink will not work properly.

- CONFIGURING WINDOWS -

These configuration instructions are for Windows XP, ME, 2000 and 98SE only. If you are using a newer version of Windows then please see the SignalLink Support page of our website for the latest instructions. If you are using a different operating system, such as Linux or the Mac OS, then please note that our support for non-Windows OS' is very limited. All available support information for these OS' is posted on the SignalLink Support page of our website.

Default Sound Card Selection

Because the SignalLink USB has its own built-in sound card, you will want to configure Windows to play its "System" sounds through your **computer's** sound card, **not** the SignalLink USB. Your communication program will be configured to use only the SignalLink USB. This will prevent any system sounds from being transmitted accidentally, and allow your computer's sound card to function as it normally would and be used for other purposes.

To configure Windows, carefully follow the steps below. Please double-check your settings as you go and do not skip any steps. If something doesn't look right, then please take a minute to go over it again as you have most likely made a simple mistake.

- Click the "Start" button and then under "Settings", click "Control Panel". The Control Panel window will open.
- In the Control Panel window, double-click the "Sounds and Audio Devices" icon.
- A "Sounds and Audio Devices Properties" window will open. This window will look similar to the one shown below in Figure 1.



Figure 1 - Sounds and Audio Devices Properties

- Click the **Audio** tab.
- Under **both** **Sound Playback** and **Sound Recording**, select your **computer's sound card** as the **Default Device**. Note that the exact name of the computer's sound card varies from computer to computer. However, unless you have more than one sound card installed, you will only see the computer's sound card and the SignaLink's **USB Audio Codec** sound card listed. **Be sure that you have selected the computer's sound card as the default device (NOT USB Audio Codec!)**, then click the OK button and close the Control Panel.
- Your computer is now configured to send all system sounds to your computer's sound card and speakers.

- SETTING THE AUDIO LEVELS -

The SignaLink USB's built-in sound card provides the same consistent audio levels no matter what computer you are using, so the software audio level setting procedure is fairly simple. Before you operate your SignaLink USB on the air, you will need to adjust the **PLAYBACK** software volume controls, and the SignaLink's TX and RX level controls. Note that the SignaLink USB does NOT use software **RECORDING** controls in Windows XP and earlier versions, so you will not need to adjust those. Adjustment of the Receive Audio level is done completely by the SignaLink's RX level control.

While most levels are not too critical, incorrect adjustment of any of these levels can cause poor performance or unreliable operation. This procedure tells you how the levels should be set.

Preliminary Setup

- Before you can adjust the audio levels, the SignaLink USB must be connected to the computer and radio. Both the SignaLink USB and the radio should be powered ON and a communication program that you have selected should be installed on your computer. Note that you will be using the communication program to generate the audio tones that are used to adjust the level controls, so CW programs should NOT be used unless they have a continuous "Tune" mode. A PSK-31 program like DigiPan is ideal for making these adjustments.
- Set the SignaLink USB's TX level control to minimum (fully counter-clockwise), and the RX level control to 50%. The Delay (**oDLYö**) control can be set to minimum for now.

Communication Program Setup

- Start your communication program and configure its Transmit and Receive sound card setting to the SignaLink USB's **USB Audio Codec** sound card. This is normally done through the program's **Configure** or **Setup** menu. Note that this setting may be labeled as **Input** and **Output** sound card, or **Playback** and **Capture** sound card.
- The SignaLink USB does **NOT** use a Serial Port (COM Port) for PTT or any other function, so you should **NOT** select one in the communication program. Serial Port selection should be set to **oNONEö**, **oCOM0ö**, or the equivalent. If your program has you select the **oPTT typeö**, then this should be set to something like **oVOXö**, **oExternalö**, or **oAlternate PTT Methodö** to allow the SignaLink to control PTT.
- If your communication program uses the 11025Hz sampling rate and you are running Windows XP, ME or 2000, then you should change the sample rate to 12000Hz to avoid possible sample rate offset errors.

TIP: If you're not sure how to configure your communication program, then please see our website at <http://www.tigertronics.com/pgmsetup.htm> for more detailed configuration information.

Radio Setup

CAUTION – Before proceeding, be sure that your radio is connected to an antenna or dummy load, and that you have a good **SWR**.

Radio setup varies widely from one model to the next. We have tried to cover the most common setup items here but we may have missed something. Please check the **Digital Operations** section of your radio manual for any additional setup information that may be needed.

- If the SignalLink USB is connected to your radio's Mic jack, then set the radio to *USB* or *LSB* as needed. USB is used for PSK31 and most digital modes. LSB is used for RTTY and some other modes. Note that your radio's RTTY mode is for FSK only and will not work with the SignalLink.
- If the SignalLink USB is connected to your radio's Data or Accessory Port, then you will likely need to select a special mode such as *Data*, *USB-D*, *LSB-D*, *User*, *Packet*, *DIG*, etc. If you are not sure which mode to use, or how to select it, then consult your radio manual.
- Select a filter that is appropriate for the digital mode that you are operating. PSK31 uses a wide filter (2.7kHz - 3kHz). Other digital modes use different bandwidths. If you're not sure which filter to use, then consult your program's documentation or an online resource.
- Set the radio's Mic Gain control to 50%. Note that if the SignalLink is connected to the radio's Data or Accessory Port, then this control will likely not have any effect on power output.
- Set the radio's RF Power control to provide maximum power (this will be adjusted to a suitable level later using the SignalLink's TX knob). Note that the RF Power control might be labeled *Forward Power* or *Carrier Power*. Newer radios usually have a menu setting instead of a knob.
- The radio's Speech Processor / Compressor and VOX features should be turned OFF.
- All noise reduction (noise blower, notch filter, DSP filtering, etc.) should be turned OFF or you may not be able to decode any signals.

Transmit Audio Adjustment

- Open the Windows Volume Control panel by clicking on the Start Button and selecting Programs (or All Programs), Accessories, Multimedia (or Entertainment), and then Volume Control.
- Click the Options menu at the top of the Volume Control panel window and then click Properties to display the Properties page.
- In the *Mixer Device* drop-down menu, click the down arrow and select *USB Audio CODEC*. This is the name of the SignalLink USB's built-in sound card, so it **MUST** be selected.
- In the *Adjust Volume For* window, select Playback.
- In the *Show the Following Volume Controls* window, verify that the Speaker and Wave controls

are checked. The other controls can also be checked but they will not be used.

- The Properties window should now look like the one shown below in Figure 2. Verify that it does and then click OK.

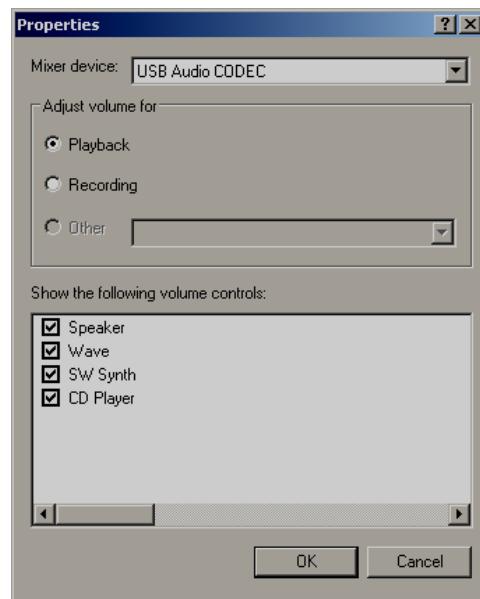


Figure 2 *Properties Window*

- The Volume Control panel will now open again and display the SignalLink's software volume controls. *USB Audio Codec* should be displayed at the bottom of the window. Set the *Speaker* control (far left control) to 100% max volume, and then set the *Wave* control to 50%. Note that the Speaker and Wave controls must **NOT** be muted or you'll be unable to transmit. The other two volume controls (SW Synth and CD Player) can be muted if you'd like. Your volume control panel should now look like the one shown below in Figure 3.

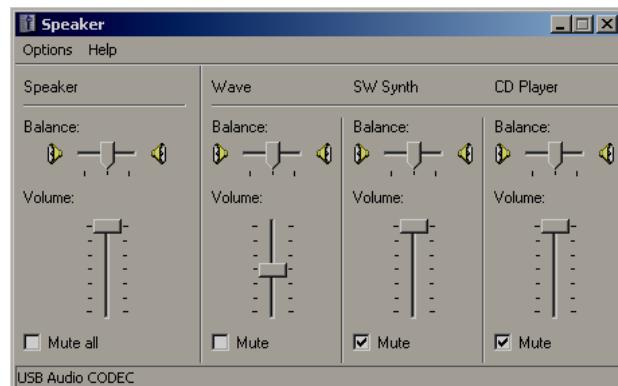


Figure 3 *Volume Control Panel*

- The SignalLink's software volume controls are now set to provide an audio level that will reliably

activate the SignaLink's PTT circuitry and provide a good Transmit Audio level for most radios. If you later determine that you need more transmit audio (complete this procedure first!), then you can increase the öWaveö control. A special jumper can also be installed inside the SignaLink USB to provide even more audio but it is rarely needed (see the öSpecial Jumperö section of this manual).

- Select öTUNEö or öTXö in your communication program. The SignaLink's red PTT LED should now be ON, and your radio should be in Transmit. If the PTT LED is not ON, then you may have the wrong sound card selected in your communication program or the software volume controls are not set correctly. If you cannot get the SignaLink's PTT LED to turn ON, then see the öTroubleshootingö section at the end of this manual.
- You should now be able to adjust the SignaLink's öTXö level control for the desired Transmit power level (see important note below). If you cannot get adequate power, or if you have too much power, or if it is difficult to adjust, then please see the öTroubleshootingö section at the end of this manual.
- Be sure to turn your program's TUNE or TX function OFF when you are finished making adjustments!

IMPORTANT: We strongly suggest that you consult your radio manual to verify the recommended maximum transmit level and duty cycle. Most digital modes are 100% duty cycle and cannot be run at full power without damaging your radio. Also, some modes typically only require 25 watts or less for reliable communication. You can actually "swamp" out other PSK31 users if you use too much power.

Receive Audio Adjustment

- The SignaLink USB does not use software öRECORDINGö controls for Windows XP and earlier versions, so all adjustment of the Receive Audio level is done with the SignaLink's öRXö level control. A setting of 50% is usually about right for most installations, but you can adjust this up or down as needed. If you find that you have too much Receive Audio or not enough, then you may need to adjust your radio's Volume control, or a menu-based level control if using a Data Port or Accessory Port. Jumper JP2 can also be installed inside the SignaLink to increase the Receive Audio level (see the öSpecial Jumperö section of this manual for details).

Ready to Operate!

That concludes the setup of the SignaLink USB, radio and computer, and at this point, the system should be ready to use. If you are new to digital operation, then we suggest

starting with PSK31 using DigiPan or a similar program. PSK31 is probably the easiest mode to operate and it works great with low power. Please take some time to read your communication program's documentation, and seek help from an online source or a fellow Ham if needed. If you experience a problem with the SignaLink, then please see the öTroubleshootingö section at the end of this manual.

- SIGNALINK CONTROLS AND INDICATORS -

PWR Switch ö This turns power ON/OFF to the SignaLink's Transmit and Receive circuits, but it does not power down the built-in sound card. The SignaLink's sound card will power down automatically with the computer when the computer is shutdown, or put into ösuspendö mode. We normally suggest that you turn the SignaLink OFF when it's not in use.

PWR LED ö This LED will be ON when the computer is powered up and the SignaLink's öPWRö switch is depressed. Note that if the computer enters ösuspendö mode and shuts off power to the USB port, then this LED will turn OFF even if the SignaLink's power switch is turned ON.

PTT LED ö This LED is ON only when the SignaLink is transmitting.

TX Control ö This knob adjusts the Transmit Audio level going to the radio, which directly affects the radio's RF power output level during SSB/Data-SSB operation. Turn this knob clockwise for more power and counter-clockwise for less. The radio's RF Power control should typically be set to 100% full power and then the SignaLink's TX knob is adjusted until the desired RF power level is measured on a watt meter or the radio's Power Output (öPOö) meter function.

NOTE: When operating with FM modulation (VHF/UHF 1200 baud Packet, EchoLink, etc.), the TX knob affects deviation, not RF power. Set the radio for the desired power level using the radio's RF Power setting and then adjust the TX knob until a clean signal is heard on a nearby radio.

RX Control ö This knob adjusts the Receive Audio level that is displayed in your communication program's waterfall or spectrum display. Turn this knob clockwise for more audio and counter-clockwise for less. 50% is a good starting point. Most programs have a level indicator that shows when the program has adequate audio.

DLY Control ö This knob adjusts the Transmit öHang Timeö for the SignaLink USB's Auto-PTT™ circuit. With the DLY knob set to minimum (fully counter-clockwise), the radio will remain keyed for approximately 28 ms after Transmit Audio has stopped. This setting is suitable for modes that require fast turn-around times like Packet. It is also the best position for most other digital modes like PSK31. A longer delay of up to 3 seconds can be selected by turning the control clock-wise. A delay of approximately 2 seconds is adequate for most Voice modes such as EchoLink. For slow AFSK CW, you will usually want a delay of 500 ms to 1 second.

- SPECIAL JUMPERS -

The SignaLink USB has three special jumpers that can be enabled to provide higher Transmit and Receive Audio levels, and increase the unit's PTT sensitivity. These jumpers are described below and their location is shown in Figure 4. To enable a jumper, simply remove it from the single metal pin that it is installed on and then reinstall it across the two visible metal pins. When removing the jumper, be sure to pull it straight up. Do not twist it or you may damage it.

JP2 ó This jumper can be enabled to increase the Receive Audio signal going into the SignaLink. This affects the audio level that you see on the waterfall or spectrum display of your communication program. If you cannot get sufficient RX Audio by adjusting the SignaLink's RX knob and the radio's output level control (if available), then you should install this jumper.

JP3 ó This jumper can be enabled to increase the SignaLink's Transmit Audio Signal. When installed, the SignaLink USB can provide up to 2Vp-p into 600 ohms. **Note that this jumper is NOT needed for most radios.** If you are unable to get sufficient RF power output, then please check the óTroubleshootingö section at the end of this manual before installing this jumper.

JP4 ó This jumper can be enabled to increase the sensitivity of the SignaLink USB's Auto-PTT™ circuit. This is not necessary for Data modes, but it can offer increased performance for voice applications by minimizing issues where the radio's RX/TX switching time causes the first part of a voice transmission to be cut off.

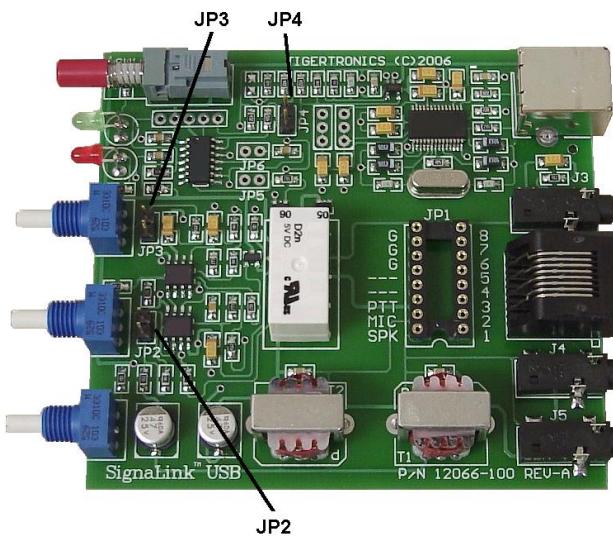


Figure 4 ó Location of jumpers JP2, JP3 and JP4.

- VISIT US ON THE INTERNET -

www.tigertronics.com

Our website contains the latest news about Tigertronics® products, support information, and other information of interest to all Hams and SWLs. This is also the best source for downloadable programs that work with our products. We also have all of our distribution software and documentation available for download as well. The site is updated often, so stop in on a regular basis and get the latest news and updates.

- YOUR COMMENTS WELCOME -

We have made every effort to make the SignaLink USB the best product possible. We welcome any comments or suggestions that you would like to make. Please drop us a note to let us know about your experiences, tips you would like to share with other users, or how we might do a better job for you.

- LIMITED WARRANTY -

Tigertronics warrants the SignaLink USB to be free of defects in material and workmanship for a period of 90 days from the date of shipment. Tigertronics will repair or replace, at its option, any parts found to be defective during the warranty period. This warranty does not include any unit that has been subject to misuse, neglect, improper installation or operation. This warranty is in lieu of all others, express or implied, and no person or representative is authorized to assume for Tigertronics any other liability in connection with the sale or use of this product. Tigertronics will not be responsible for any expense or loss of revenue or property incurred by the user due to operation or malfunction of this equipment. Tigertronics reserves the right to make any changes including but not limited to the circuit, components or firmware, or to incorporate new features, at any time, without obligation.

- RETURN POLICY -

A Return Material Authorization Number (RMA#) must be obtained before any product will be accepted for return or repair. Items received without an RMA# clearly marked on the OUTSIDE of the package WILL BE REFUSED. Items being returned must be sent prepaid. Returned items should have a note attached showing the RMA#, customer name, return address, phone number, email address, and action requested. Units being returned for warranty repair must be accompanied by a copy of the original invoice showing the date of purchase.

Customers wishing to return a product for REFUND, for ANY REASON, must receive an RMA# within 15 days from the shipping date shown on the original sales invoice. Customers returning products for refund will be charged a

Restocking Fee equal to 20% of the purchase price, to cover the cost of re-testing and re-stocking. Products that have been damaged or modified in any way may not be returned. Contact our Technical Support department for the RMA#.

- TECHNICAL SUPPORT -

BEFORE YOU CALL 6 The vast majority of technical issues can be resolved with the information that is available in this manual and on our web site. If you thoroughly investigate these resources, you will probably never need to call. Please take some time to read through this manual, and then check the online support resources to be sure that you have the most current software and documentation available. Thank you.

If you encounter a problem that you cannot resolve with the SignalLink (not software) and you have gone through the troubleshooting information available in this manual and on our website, then please contact our Technical Support Staff at (541) 862-2639. **They are available every Monday, Wednesday, and Friday, from 1PM to 5PM Pacific Time (4PM to 8PM Eastern).** Be sure to have your equipment available for testing when you call. Please DO NOT mail, email, or fax your technical inquiries. We realize that calling is a little more expensive, but more can be accomplished in a few minutes on the phone than can be done in hours of writing!

- FCC STATEMENT -

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the users authority to operate the equipment.

- GENERAL SPECIFICATIONS -

Freq Response:	300Hz to 3.3kHz
Sampling Size/Rate:	16 Bit, All standard rates are supported up to 48kHz.
Computer OS:	Windows 98SE/ME/2000/XP Windows Vista/7/8.x/10 MAC OS 9.1 or later MAC OS X 10.00 or later Linux
Radio In/Out Z:	600 Ohm (nom). TX/RX Levels are fully adjustable for compatibility with Hi-Z and Low-Z radio connections.
Auto-PTT [†] Delay:	Adjustable "Hang Time" 28 ms to >3 seconds
PTT Circuit:	Relay, 1 AMP (max)
Radio Connector:	TX/RX Audio, PTT, GND - RJ-45 RX Audio/Spkr - 3.5mm Mono
Computer Connector:	USB 1.1/2.0 Compatible Standard USB "A" type Conn.
Other Connectors:	Aux. Speaker - 3.5mm Mono Mon. - 3.5mm Mono
Case:	Extruded Aluminum - 6061T4
Dimensions:	1.6" x 3.2" x 3.6"
Operating Temp:	-30C to +60C

NOTE: The MON, AUX and SPKR jacks use stereo connectors but they are wired for mono operation (signal on the tip of the plug and ground on the sleeve). This allows for compatibility with both mono and stereo cables.

- TROUBLESHOOTING -

This section covers the most common issues that you may experience with the SignalLink USB. If your problem is not covered here then please see the SignalLink Support page of our website at http://www.tigertronics.com/sl_suprt.htm for more troubleshooting information. If you are still unable to resolve the issue, then please see the **Technical Support** section of this manual for instructions on contacting our Technical Support Staff by telephone.

My SignalLink USB was working but now will no longer Transmit - This is the most common problem that we hear about and it is virtually always due to the Windows software volume controls being reset. This can happen after a Windows update or if you unplug the USB cable. Changing the default sound card in Windows or accidentally muting

the SignalLink's Playback controls can also cause this issue. **Please check your Windows software volume controls carefully.** If they were reset, then they will be set **exactly opposite** of how they should be, so they might look correct at a glance. As outlined in this manual, the "Speaker" control should be at 100% and the "Wave" control should be at 50%. Be sure that you select "USB Audio Codec" when checking this or you will be adjusting the wrong sound card.

Radio doesn't switch to transmit. The SignalLink's PTT LED is OFF (check the status carefully!).

- Verify that the SignalLink's PWR LED is ON. If it is not, then check that the PWR switch is depressed and that the USB cable is connected to the computer and the SignalLink.
- Verify that your communication program is configured to use the SignalLink USB sound card. The program must have "USB Audio CODEC" selected as the sound card for both Transmit and Receive.
- Verify that the Windows PLAYBACK software volume controls for the SignalLink USB are set according to the "Setting The Audio Levels" procedure in this manual. If they are too low, then the SignalLink USB will NOT transmit.
- If the SignalLink is plugged into a USB hub, docking station or USB extension cable, then remove it and plug it directly into the computer until the problem is resolved. If using a desktop computer, then the SignalLink should be plugged into a rear panel USB port. Note that both unpowered hubs and powered hubs that are not specifically designed for high power USB devices, cannot supply enough power for the SignalLink to operate properly. Receive will usually work, but Transmit will not. The same issue can occur with docking stations, USB extension cables, and front panel USB ports on desktop computers only.

Radio doesn't switch to transmit. The SignalLink's PTT LED is ON (check the status carefully!).

- If the SignalLink is configured with jumper wires, then you may have installed the "PTT" or "G" jumper incorrectly. The jumper may be installed in the wrong location or it may not be pressed in all the way. If the SignalLink is connected to your radio's Mic jack, then be sure you have installed the SPKR jumper wire *ONLY* if your radio has Speaker Audio on the Mic jack, or PTT may not work properly (check your radio manual!). Please go back and double-check ALL jumpers carefully making sure that you are using the correct settings for your cable. Most radios have multiple cable options with different jumper settings, so be sure you've selected the correct one. See the "Installing Jumper Wires" section of this manual for details.

- If you have installed a jumper module inside the SignalLink instead of jumper wires, then double-check that you have the correct module installed, that it is properly configured, and that it is properly inserted in the jumper socket. See the "Installing a Plug & Play Jumper Module" section of this manual for details.

• If the SignalLink is attached to your radio's Data or Accy Port, then the radio might not be configured properly or in the correct mode. Most newer radios must be in a "digital" mode when using a Data or Accy Port connection and the digital mode must also be properly configured in the radio's menu system. Please see the "Radio Setup" section of this manual for details.

- If the SignalLink is attached to your radio's Data Port and the radio supports 9600 baud Packet, then you need to check the radio's "9600 Mode", "Packet Rate", or similarly worded menu setting and insure that it is set to "1200 baud", or "OFF". The exact wording of this menu item varies, but you will find only two choices if you are looking at the correct one. If you see other baud rates in addition to 1200 and 9600 baud, then you are looking at the wrong menu item.
- If the SignalLink is plugged into a USB hub, docking station or USB extension cable, then remove it and plug it directly into the computer until the problem is resolved. If using a desktop computer, then the SignalLink should be plugged into a rear panel USB port. Note that both unpowered hubs and powered hubs that are not specifically designed for high power USB devices, cannot supply enough power for the SignalLink to operate properly. Receive will usually work, but Transmit will not. The same issue can occur with docking stations, USB extension cables, and front panel USB ports on desktop computers only.

TIP - Be sure that the radio is actually stuck in Receive. If the radio is switching to Transmit but just doesn't have any power, then you'll want to check the next problem listed below.

TIP - Be sure that the SignalLink's radio cable is securely inserted into the correct jack on the radio. 13-pin DIN plugs can be inserted exactly upside-down even though they are keyed, so be sure to look at the jack on the radio and position the plug accordingly. Do NOT go by any arrow or other markings on the cable - You MUST look at the socket on the radio!

Radio switches to transmit but there is no RF power output, or it is too low.

- If the SignalLink is configured with jumper wires, then you may have installed the "MIC" or "G" jumper incorrectly. The jumper may be installed in the wrong location or it may not be pressed in all the way. Please go back and double-check ALL jumpers carefully making sure that you are using the correct settings for your cable. Most radios have a couple different cable options with different jumper settings, so be sure you've selected the correct one. See the "Installing Jumper Wires" section of this manual for details.
- If you have installed a jumper module inside the SignalLink instead of jumper wires, then double-check that you have the correct module installed, that it is properly configured, and that it is properly inserted in the jumper socket. See the "Installing a Plug & Play Jumper Module" section of this manual for details.

- Confirm that your radio is attached to a known good antenna or dummy load, and that your SWR is good.
 - Confirm that your position in the waterfall or spectrum display is within the audio bandpass of your radio. This is typically 500-2500Hz although it can be wider on newer radios (or much narrower if you have a narrow filter selected!). *If you are too far left or right in your program's waterfall or spectrum display, then your radio will be unable to pass the modulation and you'll have little to no RF power.*
 - If you are using a CAT interface to control your radio and the SignalLink is attached to the Data or Accy Port, then you need to disable "PTT by CAT Control" (or similarly worded option) in your communication program, so that the SignalLink can key the radio. This is necessary because most radio's will only look at the Mic jack for Transmit Audio if the radio is switched into Transmit by a CAT command.
 - Verify that your radio's RF Power control (sometimes called "Forward Power" or "Carrier Power") is set to maximum. This is often a menu setting on newer radios.
 - If the SignalLink is attached to your radio's Data or Accy Port, then the radio might not be configured properly or in the correct mode. Most newer radios must be in a "digital" mode when using a Data or Accy Port connection and the digital mode must also be properly configured in the radio's menu system. Please see the "Radio Setup" section of this manual for details.
 - If the SignalLink is attached to your radio's Mic jack, then try increasing the radio's "Mic Gain" control. This affects the Transmit Audio level going into the radio, and if it is too low then you'll have no power.
 - If the SignalLink is attached to your radio's Data or Accy Port, then try increasing the radio's menu-based Transmit Audio Input level adjustment (if available). This will affect the Transmit Audio level going into the radio, and if it is too low then you'll have no power. Note that the "Mic Gain" control may also affect the Data/Accy Port on some radios, so it is also worth trying.
 - If your radio has a built-in USB connection, then you need to be sure that the radio's "Modulation Source", "Transmit Audio Source" or similarly worded menu item is set to "ACC", "Data", or whatever setting connects it to the jack that the SignalLink is attached to (Data/Accy Port, etc.).
 - The Windows "Wave" PLAYBACK volume control can be adjusted higher than the recommended 50% level. This will increase the Transmit Audio to the radio which will increase the RF power output.
 - See the "Special Jumper" section of this manual and enable jumper JP3. This will dramatically increase the SignalLink's Transmit Audio level. Note that this is **NOT** needed for most radios, so you really need to be sure that everything else has been checked before doing this.
 - If the SignalLink is attached to a Kenwood 13-pin Accessory Port, then you may have set the PTT jumper incorrectly. Double-check the document that was supplied with your radio cable or our online support information to see what configuration your radio requires.
- Radio switches to transmit but the RF power level is too high, or difficult to control with the SignalLink's TX knob.**
- NOTE:** Be sure that the TX knob is actually affecting the RF output level before proceeding. If it has no affect whatsoever, then skip to the next problem.
- Verify that special jumper JP3 is **NOT** enabled inside the SignalLink.
 - Verify that the software "Wave" control for the SignalLink's USB's sound card is set at 50%.
 - Verify that the radio's speech processor/compressor is turned OFF.
 - If the SignalLink is attached to your radio's Mic jack, then lower the radio's Mic gain control. Too much Mic gain can make adjustment of the SignalLink's TX knob touchy.
 - If the SignalLink is attached to your radio's Data or Accy Port, then the radio may have a "Transmit Input Level" (or similar) menu setting that you can lower. Note that the "Mic Gain" control may also affect the Data/Accy Port on some radios, so it is also worth trying.
 - Some radios such as the IC-746PRO, IC-7000 and FT-450D have a very sensitive Data Port and require different settings to allow smooth control of the RF power level. For these radios we suggest that you do **ALL** of the following:
 - 1 Install special jumper JP4 inside the SignalLink.
 - 2 Set your radio's RF Power setting 10 watts higher than the desired power level. For example, if you want to run 10 watts for PSK31, then set the radio for 20 watts.
 - 3 With your communication program in Transmit and the SignalLink's DLY knob OFF (fully counter-clockwise), lower the software "Wave" control for the SignalLink's sound card all the way down to 0%. The SignalLink's PTT LED should turn OFF. Next, very slowly adjust the Wave control back up until PTT just turns ON. Note this threshold point and then adjust the Wave control 15-20% higher. The idea is to have the Wave control set as low as possible while maintaining reliable PTT activation. You may want to repeat this step a few times to be sure you have correctly identified the threshold point. Note that if you set the Wave control too low, PTT will be intermittent or not function at all.
- Radio switches to transmit and puts out power, but the SignalLink's TX knob has no affect on the power level -** This is most likely because the radio is in an FSK mode instead of AFSK. Please see the "Radio Setup" section of this manual for help selecting your radio's AFSK mode.

Transmit signal is “wide” or distorted – This is virtually always the result of over-driving your radio. The most common cause of this problem is adjusting your RF Power output with the radio's RF Power control instead of the SignalLink's TX knob. Please see the problem; “**Radio switches to transmit but the RF Power level is too high, or difficult to control with the SignalLink's TX knob**” above and go through the steps listed there.

I can't seem to receive. Waterfall or spectrum is blank or dark (Receive Audio is NOT present).

- Confirm that the SignalLink USB is powered ON and set the SignalLink's RX Knob to 100% (you'll need to readjust this later once the problem has been resolved).
- Confirm that your radio's squelch is open (noise should be heard in the speaker even with no signal present).
- Set the radio's Volume control to 50% (you may need to adjust this later once the problem has been resolved).
- Verify that your communication program is configured to use the SignalLink's “USB Audio Codec” sound card (**NOT** the computer's sound card!) for both Transmit and Receive.
- The Receive Audio signal may not be getting to the SignalLink. Go back through the “Configuring the SignalLink” and “Connecting the Radio” sections in this manual to check this. Pay careful attention to whether or not the supplied audio cable needs to be connected, or if you need to install the SPK jumper wire inside the SignalLink, or enable the SPKR jumper on the jumper module.
- If the SignalLink is attached to your radio's Data or Accy Port jack, then the radio may have a menu-based RX Audio output level control that needs to turned up.
- If the SignalLink is attached to your radio's Data Port and the radio supports 9600 baud Packet, then you need to check the radio's “9600 Mode”, “Packet Rate”, or similarly worded menu setting and insure that it is set to “1200 baud”, or “OFF”. The exact wording of this menu item varies, but you will find only two choices if you are looking at the correct one. If you see other baud rates in addition to 1200 and 9600 baud, then you are looking at the wrong menu item.

Receive audio is present in the waterfall/spectrum display and adjustable with the SignalLink's RX knob, but it is too low. ó Verify that the SignalLink's RX knob is turned up (clockwise). If the SignalLink is attached to your radio's Mic jack then try increasing the radio's Volume control. If the SignalLink is attached to your radio's Data/Accy Port, then try increasing the radio's menu based RX Audio output level control (if available). Special jumper JP2 may need to be installed inside the SignalLink to increase the RX Audio level. See the “Special Jumpers” section of this manual for details.

I can't seem to receive. Waterfall or spectrum looks good (Receive Audio is present) - No matter how good your antenna and radio are, there will always be some stations

that you cannot copy (even with strong signals!). While the reason for this may be because of operator error (wrong mode or baud rate, off frequency, noise blanker turned on, etc.), radio wave propagation problems can often prevent you from receiving. Some modes are more susceptible to this than others. For example, even though PSK31 usually works very well with weak signals, sometimes even strong PSK31 signals cannot be copied at all because of multipath and Doppler Shift propagation problems. Other modes like HF Packet and RTTY do not work well with weak signals and are susceptible to multipath and Doppler Shift.

If you are having trouble receiving other stations then we would suggest testing with a PSK31 program such as DigiPan. The 20 meter PSK31 frequency of 14.070MHz is usually the most active frequency (use USB or USB-Data on the radio).

Windows System Sounds cause the SignalLink to transmit ó This will NOT happen if you configure Windows to use the **computer's sound card** as the default sound card. See the “Configuring Windows” section of this manual to resolve this problem.

Adjusting the Windows Volume Control Panel has no effect ó If this happens, then you are almost certainly adjusting the volume controls for the wrong sound card. Please go back to the “Setting The Audio Levels” procedure and pay careful attention to Figure 2, where “USB Audio Codec” is selected as the mixer device.

Every time I open the Windows Volume Control Panel, it always displays the computer's sound card ó This is normal. Windows always shows the default sound card when the Volume Control Panel is opened. If you have configured Windows properly, then the computer's sound card is the default sound card, and it will always be displayed when the Volume Control Panel is opened. To adjust the SignalLink's sound card, simply follow the steps in the “Setting The Audio Levels” section of this manual.

I cannot open or view the SignalLink CD - All CDROM drives with a slide-out tray will accept the mini SignalLink CD (it cannot be used with “slot” type CDROM drives). Place the CD in the small circular recess area in the bottom of your drive tray. The CD should seat properly and not slide around. When you insert the CD into your computer it should “AutoStart” after a few seconds, and display the opening screen in your web browser. If it does not, then you will need to start your web browser, and open the “STARTCD.HTM” file manually. If you are unable to access the CD for any reason, the same software (plus much more!) can be downloaded from the “SignalLink Software” page of our web site at www.tigertronics.com.