

owner's manual



Link.USB

24-BIT USB AUDIO INTERFACE



TOTAL AUDIO PRODUCTION

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Only use attachments/accessories specified by the manufacturer.
10. Unplug this apparatus during lightning storms or when unused for long periods of time.
11. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

FCC Information

NOTE: *This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

Product Serial #:

Purchased at:

Date of purchase:

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Tracktion 2.0

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- 8. Upgrades.** LOUD may at its discretion release upgrades to the Software. LOUD has no obligation to offer free or discounted upgrades to any end user of the Software.
- 9. Governing Law and Severability.** This Agreement will be governed by the laws of the State of Washington and will be interpreted as if the agreement were made between Washington residents and performed entirely within Washington. If for any reason a court finds any provision of this License unenforceable, that provision will be enforced to the maximum extent possible, and the remainder of the License shall continue in full force and effect.
- 10. Entire Agreement.** This is the entire agreement between you and LOUD Technologies Inc. AND supersedes any prior agreement, whether written or oral, relating to the subject matter of this Agreement. No amendment or modification of this agreement will be binding unless in writing and signed by a duly authorized representative of LOUD Technologies Inc.

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Don't forget to visit our website at www.tapcogear.com
for more information about this and other TAPCO products.

INTRODUCTION

Thank you for purchasing the TAPCO Link.USB Audio Interface for digital recording systems. This is a complete, compact solution for computer-based music production on either a Macintosh or a PC.

The Link.USB is a 2x2 USB interface that is powered directly off the USB connection, and also includes Traktion 2, our powerful audio and MIDI sequencing software for digital recording. This hardware and software combination provides all you need to record and create wonderful music using your laptop or desktop computer.

The Link.USB Interface

The Link.USB interface provides two analog audio inputs that can accept microphone level, line level, or direct instrument input signals. The analog audio signals are routed to high-quality ADCs (Analog-to-Digital Converters) operating at 44.1, 48, 88.2, or 96 kHz with 24-bits. The digital signal is then routed to the USB port for connection to your computer.

The analog inputs are “combo” jacks that accept either a balanced XLR connector or a balanced or unbalanced 1/4" TRS or TS connector.

When a microphone is plugged into an XLR input, that channel automatically adjusts to become a mic input. When a 1/4" TRS or TS connector is plugged in, that channel adjusts to become a line-level input (or an instrument-level input if the INSTRUMENT button is pressed in).

Master mixes can also be transferred from your host computer back to the Link.USB for monitoring during tracking or overdubbing. A front panel MIX knob is provided to add low-latency direct monitoring (from the analog inputs) to playback monitoring (from the USB input). Monitoring is provided by the headphone jack on the front, and by balanced outputs on the back, each with their own level controls.

Bundled Software

The Link.USB comes with some incredibly powerful software to get you started with your own desktop multitrack audio recording music production studio.

Traktion 2 is an easy-to-use multitrack audio recording and MIDI sequencing software application, capable of unlimited track count, VST support, automation, and much more. It comes with a plethora of plug-ins to give you a wide variety of EQ, compressor, and effects processors to use in creating exactly the sound you want.

GETTING STARTED

Use this section to get your Link.USB set up quickly.

Installing the Software

- The Link.USB CD contains an installer that will install the Tracttion 2 software application, plug-ins, and drivers.
- Visit <http://my.tapcogear.com> to register your Link.USB. If you haven't already done so, set up an account by entering your email address and clicking, "No, I want to create an account." Then click "Continue." Enter the information to set up your profile. Then click "Create My Account." Then proceed to register your Link.USB by clicking "TAPCO Product Registration."
- Your computer **must** meet the following minimum system requirements:

PC Requirements

- Windows XP (SP2)
- Pentium III or better processor
- 256 MB RAM (512 MB recommended)
- 40 MB hard disk space

Macintosh Requirements

- OS X (10.3 or later)
- Power Mac G3 (600 MHz or faster), G4, or G5 processor
- 256 MB RAM (512 MB recommended)
- 35 MB hard disk space

To install the software on a PC running Windows XP (SP2):

1. Turn off any (non-essential) applications.
2. Insert the Link.USB CD-ROM into your PC's CD-ROM drive.
3. The CD should begin automatically, bringing up the Link.USB installer.

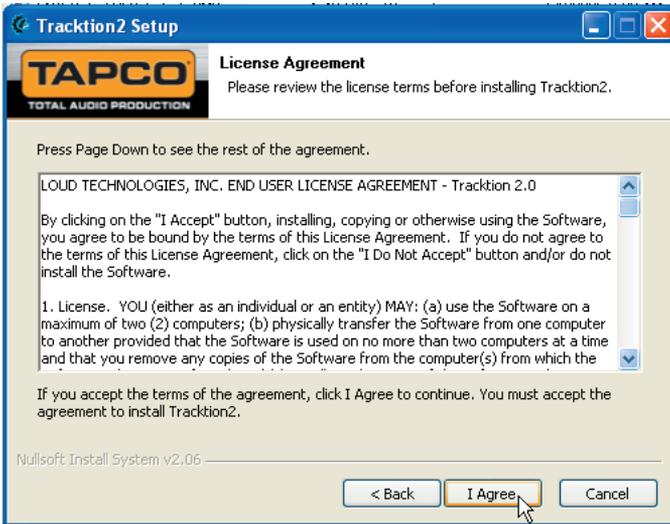


If not, click Start in the task bar, then click Run and click Browse. Browse to your CD drive and double-click SETUP.EXE. Then click OK to start the installation.

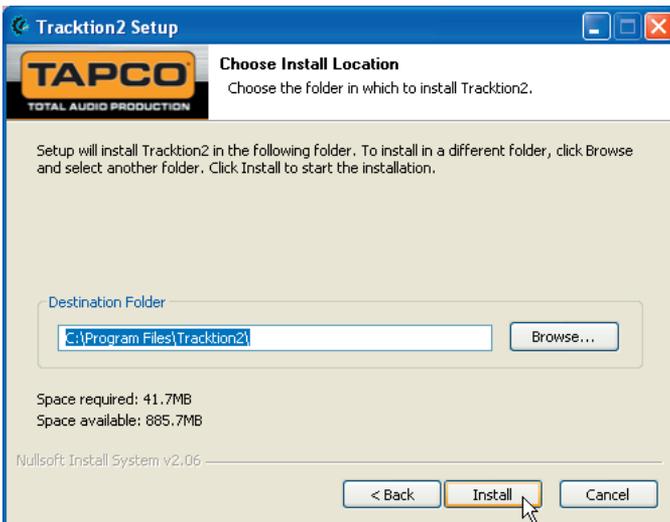
4. The Trackson 2 Setup Wizard opens. Click "Next."



- Next you will see the Tracktion License Agreement. Read through the text and click “I Agree.”



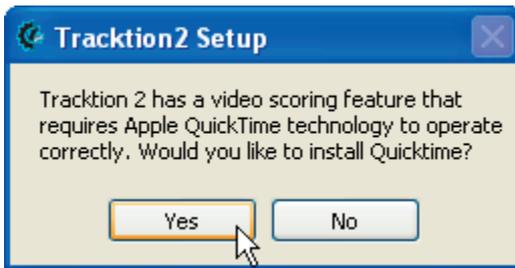
- The next window lets you choose the Destination folder for installing the software files. We recommend you use the default location used by the installer, but you can choose a different location if you want by clicking the Browse button. Then click “Install.”



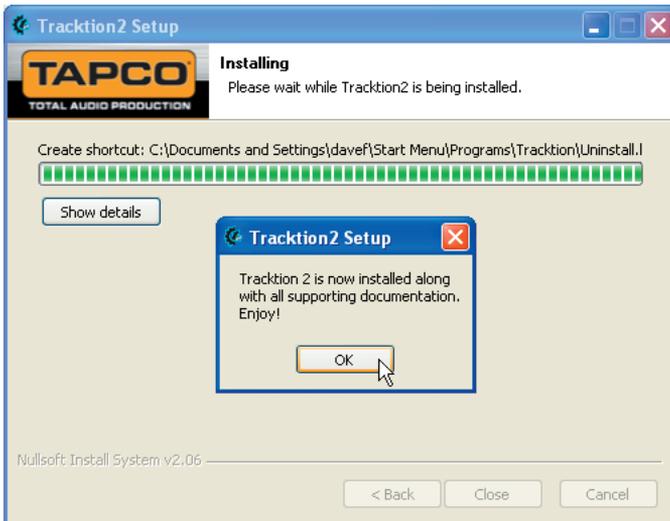
- When the installer has completed copying the files into the destination folder, the All Installed dialog box opens. Click OK to continue.



- A window opens asking if you want to install QuickTime. Click "Yes" if you want to install it, or "No" to continue.

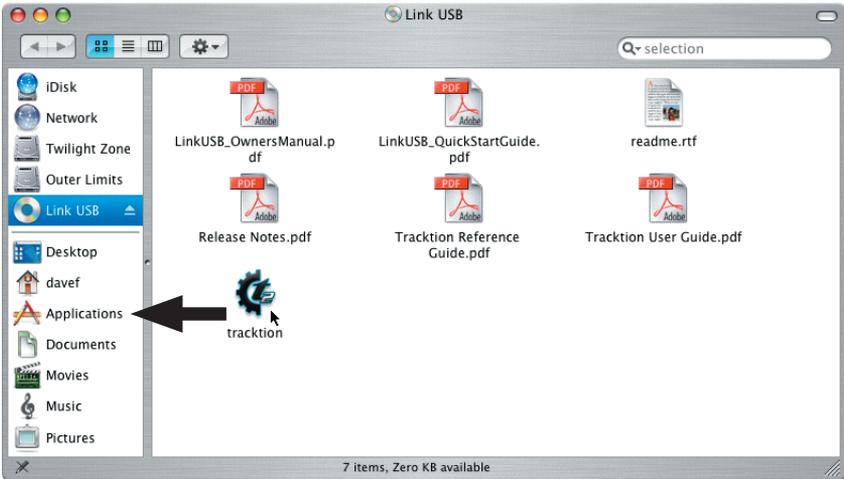


- The Tracktion 2 Setup window opens to inform you that everything is installed. Click OK to finish the installation.



To install the software on a Macintosh running OS X (version 10.3 or later):

1. Turn off any (non-essential) applications.
2. Insert the Link.USB CD-ROM into the CD-ROM drive.
3. Double-click the Link USB CD icon on the desktop.



4. To install Tracttion 2, simply drag the Tracttion application file into your Applications directory.
5. Go ahead and drag the documentation PDFs to your Applications directory (or anywhere you want to keep them on your hard drive). These include:
 - LinkUSB_Owner's Manual.pdf
 - LinkUSB_QuickStartGuide.pdf
 - Release Notes.pdf
 - Tracttion User Guide.pdf
 - Tracttion Reference Guide.pdf
6. Double-click the Tracttion file in the Applications folder to open Tracttion 2.

Authorizing Tracktion 2

There is an authorization code on the sleeve of the CD-ROM that came with your Link.USB. You can authorize the software from within Tracktion or by going to <http://my.tapcogear.com>.

From Tracktion 2:

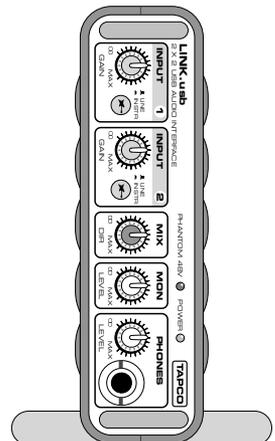
1. Open Tracktion 2.
2. Tracktion detects that the software is unregistered and notifies you that it is running in Demo Mode. You can choose to continue or click the “Unlock” button to authorize the software.
3. Follow the instructions for unlocking Tracktion.

From my.tapcogear.com:

1. Go to <http://my.tapcogear.com>.
2. If you haven’t already done so, set up an account by entering your email address and clicking, “No, I want to create an account.” Then click “Continue.”
3. Enter the information to set up your profile. Then click “Create My Account.”
4. Then proceed to register Tracktion by clicking “Mackie Product Registration.”
5. Select “Software” and “Tracktion v2 Music Production Software.”
6. Click “Click here to register Tracktion v2 online.”
7. Enter the authorization code from the sleeve on your CD-ROM in the License Number box. Then click “Authorize.”

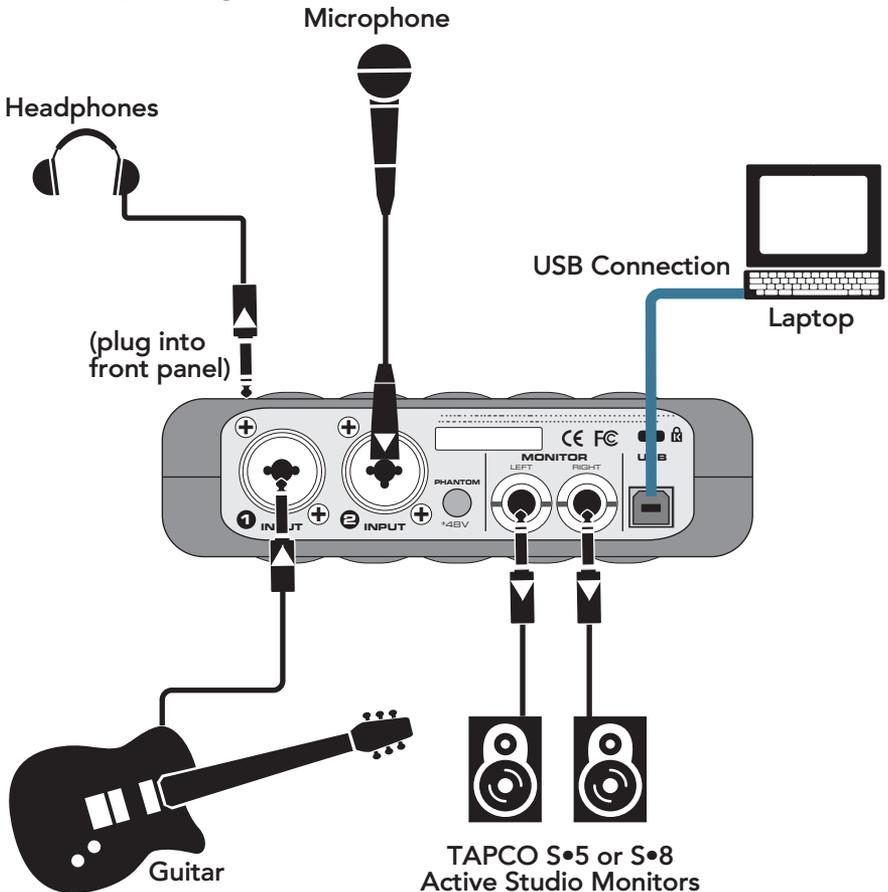
Connecting the Link.USB

- To stand the Link.USB upright, pull the stabilizer bar downward and twist it out 90° from the body, as shown here.
- Turn down all the Link.USB knobs to prevent any loud surprises.
- Connect microphones using the XLR/TRS combo input connectors on the back of the Link.USB. Press the 48V button if your microphone needs phantom power (mostly used for condenser mics).



- Connect guitars or other instruments using the XLR/TRS connectors on the back of the Link.USB. Press the front panel LINE/INSTR button (guitar icon) if you are connecting your guitar or instrument directly to the Link.USB without using a preamplifier or direct box.
- Connect a pair of powered monitor speakers, or an amplifier connected to speakers, to the Link.USB MONITOR jacks on the rear panel. You can also plug in headphones to the front panel PHONES jack.
- Connect the USB connector to a USB port on your computer with the USB cable provided.
- Launch Tracktion 2 or the DAW software application of your choice and select Link.USB as the audio device for the audio inputs and outputs.

Hookup Diagram

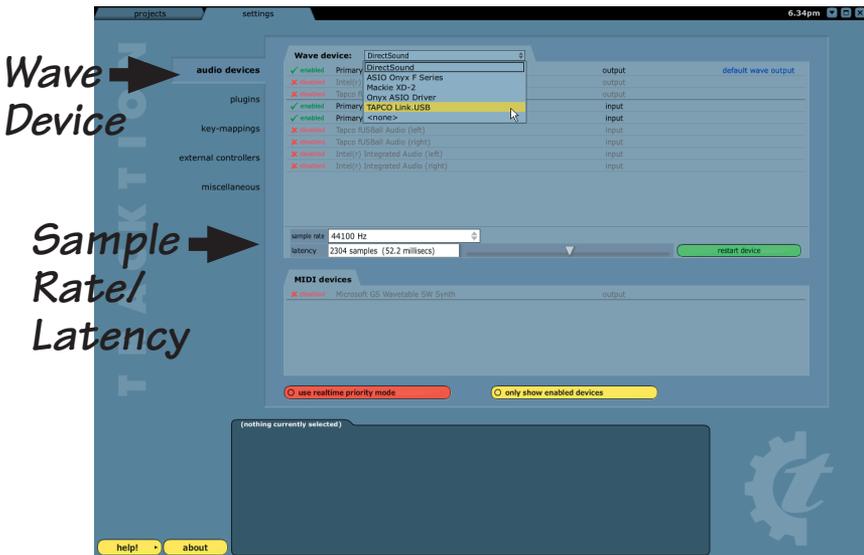


Making a Recording

The following example of a recording session uses a guitar plugged directly into the Link.USB channel 1 input, and a microphone plugged into the channel 2 input, to record audio tracks in the Tracktion 2 software.

Before starting, make sure you have correctly installed the Tracktion 2 software.

1. Connect your equipment using the diagram on the previous page as a guide.
2. On the Link.USB front panel, set the INPUT GAIN, MON, and PHONES knobs to minimum, and the MIX knob to maximum. Press the 48V button on the rear panel if your microphone needs phantom power. Press the LINE/INSTR button on Channel 1 if you are not using a guitar preamp or direct box.
3. On your computer, open Tracktion 2. Make sure you have the Link.USB selected as the audio input/output device (under the Settings tab > Audio Devices > Wave Device).



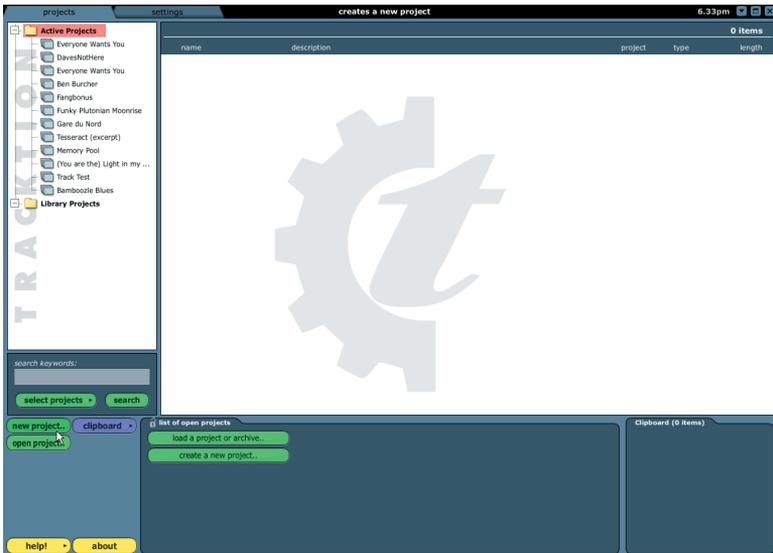
You can select the sample rate and the latency in the Settings tab. For more details about Tracktion 2, press the Help! button in the lower left-hand corner.



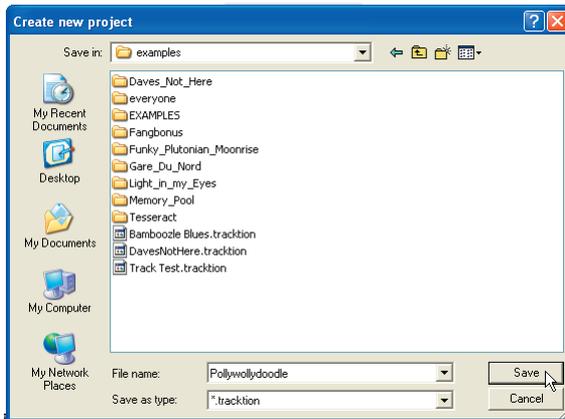
Latency describes the amount of time it takes for audio to get in and out of your software application. The lower the latency setting, the faster audio can get into and out of the software application. However, a low latency setting requires more resources from your computer, so you need to find a happy balance between finding the

lowest latency setting you can attain before the computer begins to have trouble routing and recording audio (e.g., dropouts, pops, distorted audio). See “What is Latency” on page 33 for more info.

4. Click the New Project button under the Projects tab.



Enter a name for your new project and click “Save.”



- “New edit #1” appears at the top of the item list. An edit is Tracktion’s way of keeping a version of your song. You can rename the song by clicking on the edit and entering the new name in the properties panel at the bottom of the screen.
- Double-click on “new edit #1” to open up the Edit screen. A new project starts with eight horizontal tracks, stacked vertically. You can add or remove tracks once you get going. Tracks can also be renamed by selecting them and typing the new name in the Properties panel.



- The two audio icons represent the Link.USB’s two inputs. If these two icons do not appear, make sure Link.USB is selected as the audio devices under the “Settings” tab.

- Click on the Input 1 icon, and drag it to track 1. As it gets close, an arrow pops out and connects the icon to the track. This indicates that the track is armed for recording. To disconnect an icon (and disarm the track), drag it to the left and the arrow will disappear.



- Play the guitar and slowly turn up the front panel INPUT 1 GAIN knob about halfway. You should see the input meters in Tracktion indicating that a signal is present. Make sure the overload indicator doesn't light. If it does, turn down the GAIN knob until the musical peaks no longer light the overload indicator. If the meter is barely indicating a signal, turn up the GAIN knob.
- We will begin by recording the guitar. Click on the Input 1 icon to highlight it. The input meters (in the Properties panel) will show the signal level being recorded.
- With the MIX knob turned fully clockwise to MAX, put on the headphones and slowly turn up the PHONES knob to a comfortable listening level while playing the guitar. Now you can monitor what you are playing.
- To record, click the Record button in the Transport area (or press the "R" key on the keyboard). Tracktion records any armed tracks. Play your guitar as the vertical cursor line moves to the right.
- To stop recording, click the Record button again (or the "R" key). A squiggly line (amplitude vs. time waveform) of your recording is displayed.

14. To play back your guitar recording, click the RTZ (Return to Zero) button in the Transport area and click the Play button. If you are happy with the recording, drag the Input 1 icon to the left to disarm the track.
15. To record some vocals, drag the Input 2 icon to track 2. This arms the track for recording the microphone connected to Input 2 on the Link.USB. Adjust the Input 2 GAIN knob so your vocals do not light the overload indicator in Tracktion. Use the MIX knob to adjust the balance in your headphones and monitors between the guitar recording and the direct input from the microphone.
16. Click the Record button to record your vocals while listening to the guitar track.
17. You can record more instruments on more tracks and build a multitrack masterpiece by continuing in a similar fashion. As you record and play other tracks, you can mute any tracks you don't want to hear by clicking the "M" button at the far right side of the track.
18. Tracktion has a number of plug-ins that you can use to enhance each track. Refer to the Tracktion User's Guide or Reference Guide for more information on using plug-ins and creating a stereo mix for burning to CD or creating an MP3 file.

LINK.USB FEATURES

Front Panel

1. INPUT GAIN Control

These knobs adjust the analog gain of the input signal (before the A/D converters). They adjust the signal for both the mic and line inputs. Turn the knob fully counter-clockwise to turn the signal off, and fully clockwise to get the maximum gain.

2. LINE/INSTR Switch

If you are using a normal line-level input, leave this switch out. If you are connecting an instrument like a guitar directly to the Link.USB, push this switch in. It adjusts the input impedance of the 1/4" input to match the high-output impedance of a guitar pickup.

3. MIX Control

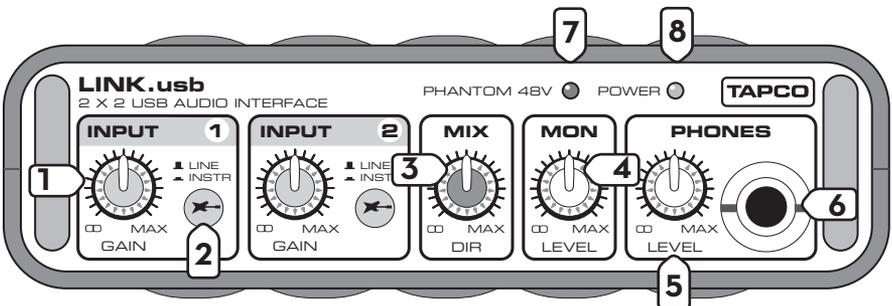
This knob adjusts the signal going to your headphones and monitor out. It allows you to blend the direct input signal with the USB signal coming from your computer. In the fully counter-clockwise position, only the USB signal is present in the headphones and monitors. As the MIX knob is rotated clockwise, the input signal is added to the mix.

4. MON LEVEL Control

This adjusts the level of the rear panel MONITOR analog outputs. It does not affect the headphone output.



Note: Leave this knob turned down each time you turn on your system, and then increase it to a safe listening volume.



5. PHONES LEVEL Control

This adjusts the level of the PHONES analog output on the front panel. It does not affect the MONITOR output.



Note: Make sure the PHONES LEVEL control is turned all the way down before plugging in your headphones. This will protect your hearing and prevent any loud surprises.

6. PHONES Jack

The PHONES jack accepts a 1/4" TRS stereo plug normally used on headphones. If your headphones have a 1/8" mini-plug, you will need a 1/8" to 1/4" stereo adapter, commonly sold in electronics and audio stores.

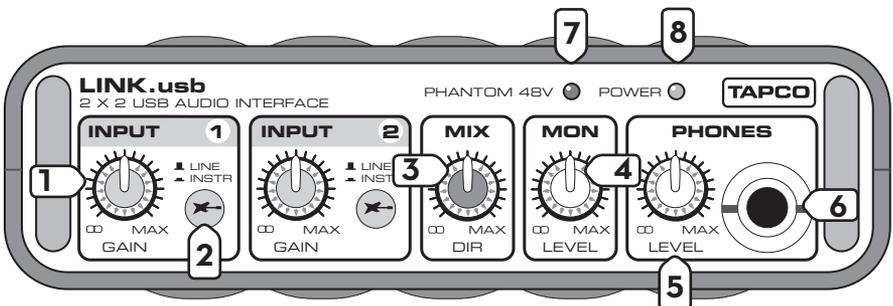
The headphone signals are the same as the Monitor Output signals, except the level is controlled by the PHONES LEVEL control instead of the MON LEVEL control. (The Monitor outputs and the Phones output are both affected by the MIX knob.)

7. PHANTOM 48V Indicator

This red LED lights up when the PHANTOM 48V switch [10] on the rear panel is engaged.

8. POWER Indicator

The Link.USB is powered from the USB port. There is no power switch, so this LED lights up whenever the Link.USB is connected to the USB port on your computer (and the computer is powered on).



Rear Panel

9. INPUT

These are Neutrik combo connectors, which accept balanced microphone inputs from an XLR connector, or balanced or unbalanced line-level or instrument-level inputs from a 1/4" TRS connector.

The XLR inputs are wired as follows:

- Pin 1 = Shield or ground
- Pin 2 = Positive (+ or hot)
- Pin 3 = Negative (- or cold)

The 1/4" inputs are wired as follows:

- Sleeve = Shield or ground
- Tip = Positive (+ or hot)
- Ring = Negative (- or cold)

10. PHANTOM 48V Switch

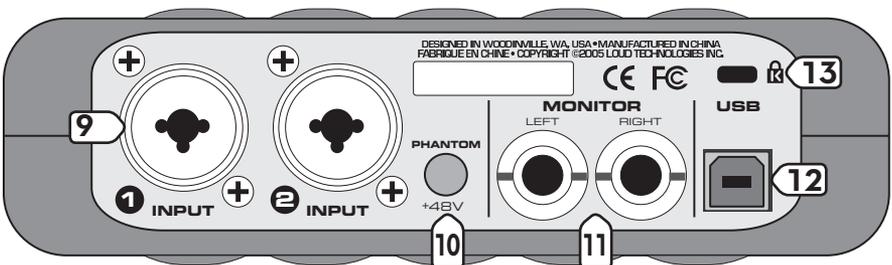
Push this button in if you are using a microphone that requires 48 VDC phantom power. This applies phantom power to pins 2 and 3 of both XLR inputs. It has no effect on the 1/4" inputs.



Note: There are just a few microphones (mostly ribbon mics) that can be damaged by phantom power. Consult your microphone's owner's manual to see if it needs it or not. If it does, always turn off the phantom power switch before connecting or disconnecting your microphone.

11. LEFT/RIGHT MONITOR Out

These 1/4" TRS connectors provide a balanced stereo line-level output of the monitor mix. Connect these outputs to a pair of active monitor speakers, or to an amplifier connected to passive speakers. The signal level is controlled by the MONITOR LEVEL control [4] on the front panel.

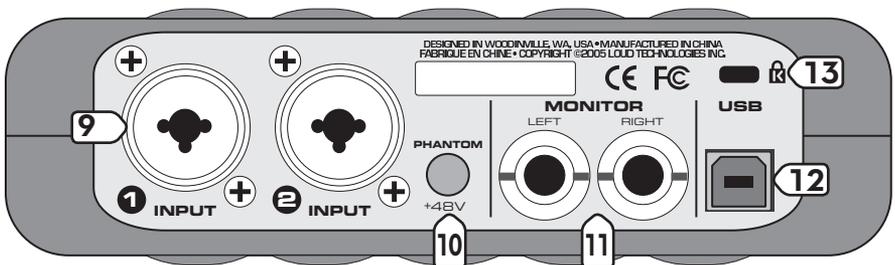


12. USB Connector

This is the main connection between the Link.USB and the host computer. Use the USB cable provided to connect this port to a USB port on your computer.

13. Kensington Security Slot

To help prevent theft, the Link.USB has a security slot designed to fit the popular Kensington security locks. A variety of models are available from their website at www.kensington.com.



APPENDIX A: SERVICE INFORMATION

Warranty Service

Details concerning Warranty Service are spelled out in the Warranty section on page 32.

If you think your TAPCO Link.USB has a problem, please do everything you can to confirm it before calling for service. Doing so might save you from the deprivation of your Link.USB and the associated suffering.

These may sound obvious to you, but here are some things you can check. Read on.

Troubleshooting

No Power

- Our favorite question: Is it plugged in? Make sure the USB cable is connected between your computer and the Link.USB. The computer must be on to provide power to the Link.USB over the USB connection.
- Is the orange POWER LED illuminated? If not, try connecting the Link.USB to another USB port on the computer (if available).

No Signal

- Is the Input GAIN turned up?
- Is the MIX control turned all the way to one side? Set the MIX control to the center position to hear a mix of the direct input signal and signal coming from the USB port.
- Is the PHONES Level control and the MONITOR Level control turned up?
- Is the Link.USB selected as the audio input/output device in your DAW application? In Tracktion, this is selected in the Settings tab under Audio Devices.
- Be sure the correct inputs are selected in the DAW and the tracks are armed.

My guitar (or other instrument) doesn't sound as good as I expect

- If your guitar is connected directly to the Link.USB (i.e., without a direct box or preamp), be sure the LINE/INSTR button on the front panel is pushed in.
- Make sure the Input GAIN control is set correctly and not causing distortion.
- Perhaps private lessons are in order.

Glitchy/Distorted Audio into your Computer

- Is the overload indicator lighting in the DAW application? If so, try turning down the Input GAIN control on the Link.USB or the input level control in the DAW.
- Increase the latency. In Tracktion, this is done in the Settings tab under Audio Devices.
- In other applications, find the control panel to increase the ASIO (PC) or Core Audio (Mac) buffer size or latency.
- Be sure the Link.USB is the only device on the USB chain. We do not recommend using USB hubs with the Link.USB.

Lonely? Looking for that special someone?

Do you have a question about your TAPCO Link.USB?

Please call our Technical Support chaps at **1-877-827-2669**,
Monday to Friday, from 7 am to 5 pm PST.
After hours, visit www.tapcogear.com and look under **Contact Us**,
or e-mail us at techmail@tapcogear.com

Repair

Service for TAPCO products is available at a factory-authorized service center. Service for TAPCO products living outside the United States can be obtained through local dealers or distributors.

If your Link.USB needs service, follow these instructions:

1. Review the preceding troubleshooting suggestions. Please.
2. Call Tech Support at 1-877-827-2669, 7 am to 5 pm PST, to explain the problem and obtain a Service Request Number. Have your mixer's serial number ready.

You must have a Service Request Number before you can obtain factory-authorized.

3. Keep this owner's manual. We don't need it to repair the Link.USB.
4. Pack the Link.USB in its original package, including endcaps and box. This is **VERY IMPORTANT**. When you call for the Service Request Number, please let Tech Support know if you need new packaging. You can order new packaging through our parts department. *TAPCO is not responsible for any damage that occurs due to non-factory packaging.*
5. Include a legible note stating your name, shipping address (no P.O. boxes), daytime phone number, RA number, and a detailed description of the problem, including how we can duplicate it.
6. Write the Service Request Number in **BIG PRINT** on top of the box. Units sent to us without the Service Request Number will be refused.
7. Tech Support will tell you where to ship the unit for repair. We suggest insurance for all forms of cartage.
8. You will need to contact the authorized service center for their latest turn-around times. The Link.USB must be packaged in its original packing box, and must have the Service Request Number on the box. Once it's repaired, the authorized service center will ship it back by ground shipping, pre-paid (if it was a warranty repair).

Note: Under the terms of the warranty, you must ship or drop-off the unit to an authorized service center. The return ground shipment is covered for those units deemed by us to be under warranty.

Note: You must have a sales receipt from an Authorized TAPCO Dealer to qualify for a warranty repair.

APPENDIX B: CONNECTIONS

XLR Connectors

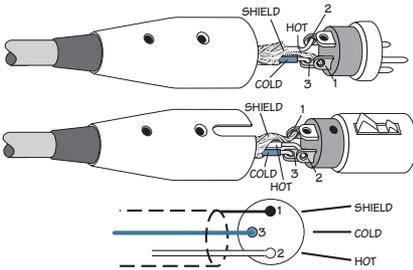
The “combo” inputs on the Link.USB accept 3-pin male XLR connectors. They are wired as follows, according to standards specified by the AES (Audio Engineering Society).

XLR Balanced Wiring:

Pin 1 = Shield

Pin 2 = Hot (+)

Pin 3 = Cold (-)



Balanced XLR Connector

1/4" TRS Phone Plugs and Jacks

The “combo” inputs on the Link.USB also accept balanced or unbalanced 1/4" TRS or TS connectors. “TRS” stands for Tip-Ring-Sleeve, the three connections available on a stereo 1/4" or balanced phone jack or plug. TRS jacks and plugs are used for balanced signals and stereo headphones. They use three-conductor shielded cable and are wired as follows:

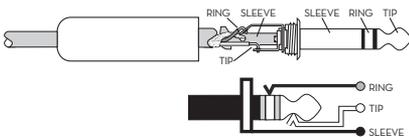
Balanced Mono

1/4" TRS Balanced Mono wiring:

Sleeve = Shield

Tip = Hot (+)

Ring = Cold (-)



Balanced 1/4" TRS Connector

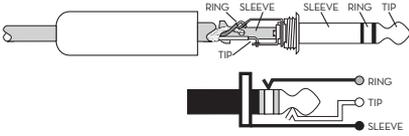
Stereo Headphones

1/4" TRS Stereo Unbalanced Wiring:

Sleeve = Shield

Tip = Left

Ring = Right



Stereo Headphones 1/4" TRS Connector

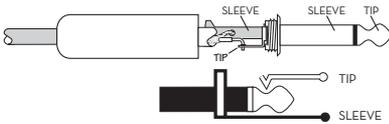
1/4" TS Phone Plugs and Jacks

“TS” stands for Tip-Sleeve, the two connections available on a mono 1/4" phone jack or plug. They are used for unbalanced signals.

1/4" TS Unbalanced Wiring:

Sleeve = Shield

Tip = Hot (+)



Unbalanced 1/4" TS Connector

APPENDIX C: LINK.USB SPECIFICATIONS

Analog Specifications

Frequency Response

Any Input to Monitor Output:	+0, -0.5 dB, 22 Hz to 22 kHz @ 48 kHz SR
Any Input to Phones Output:	+0, -3 dB, 30 Hz to 22 kHz @ 48 kHz SR (600Ω load)

Distortion

THD + Noise (1 kHz, -1 dBFS @ 48 kHz SR)	
Mic Input to Monitor Output:	< 0.005%

Dynamic Range

Mic Input to Monitor Output (48 kHz SR, A-weighted):	100 dB
------------------------------------------------------	--------

Input Impedance

Mic Input:	3 kΩ
Line Input:	20 kΩ balanced, 20 kΩ unbalanced
Instr Input:	1 MΩ

Output Impedance

Monitor Output:	200Ω
Headphone Output:	< 1Ω

Crosstalk

Monitor Output (1 kHz, Left to Right)	-70 dB
Headphone Output (1 kHz, Left to Right)	-80 dB

Maximum Input Level

Mic In (XLR):	-2.2 dBu
Line In:	+4.5 dBu
Instr In:	+5.4 dBu

Maximum Output Level

Monitor Output:	+4.2 dBu
Headphone Output:	18 mW into 600Ω

Digital Specifications

A/D and D/A Conversion

24 bit, 44.1/48/88.2/96 kHz

System Requirements

PC:	Windows XP (SP2) Pentium III with 256 MB RAM (512 MB or more is recommended for Tracktion) Super VGA (1024 x 768) or higher resolution video adapter and monitor 40 MB hard disk space CD-ROM or DVD drive USB port
Macintosh:	OS X 10.3 or higher Power Mac G3 or higher (600 MHz) 256 MB RAM (512 MB or more is recommended for Tracktion) 35 MB hard disk space Native USB port (G3/G4 accelerator cards not supported)

Physical Dimensions and Weight

Height:	1.7 in/43 mm
Width:	6.1 in/155 mm
Depth:	6.8 in/173 mm 7.6 in/193 mm with handles
Weight:	1.4 lb/0.6 kg

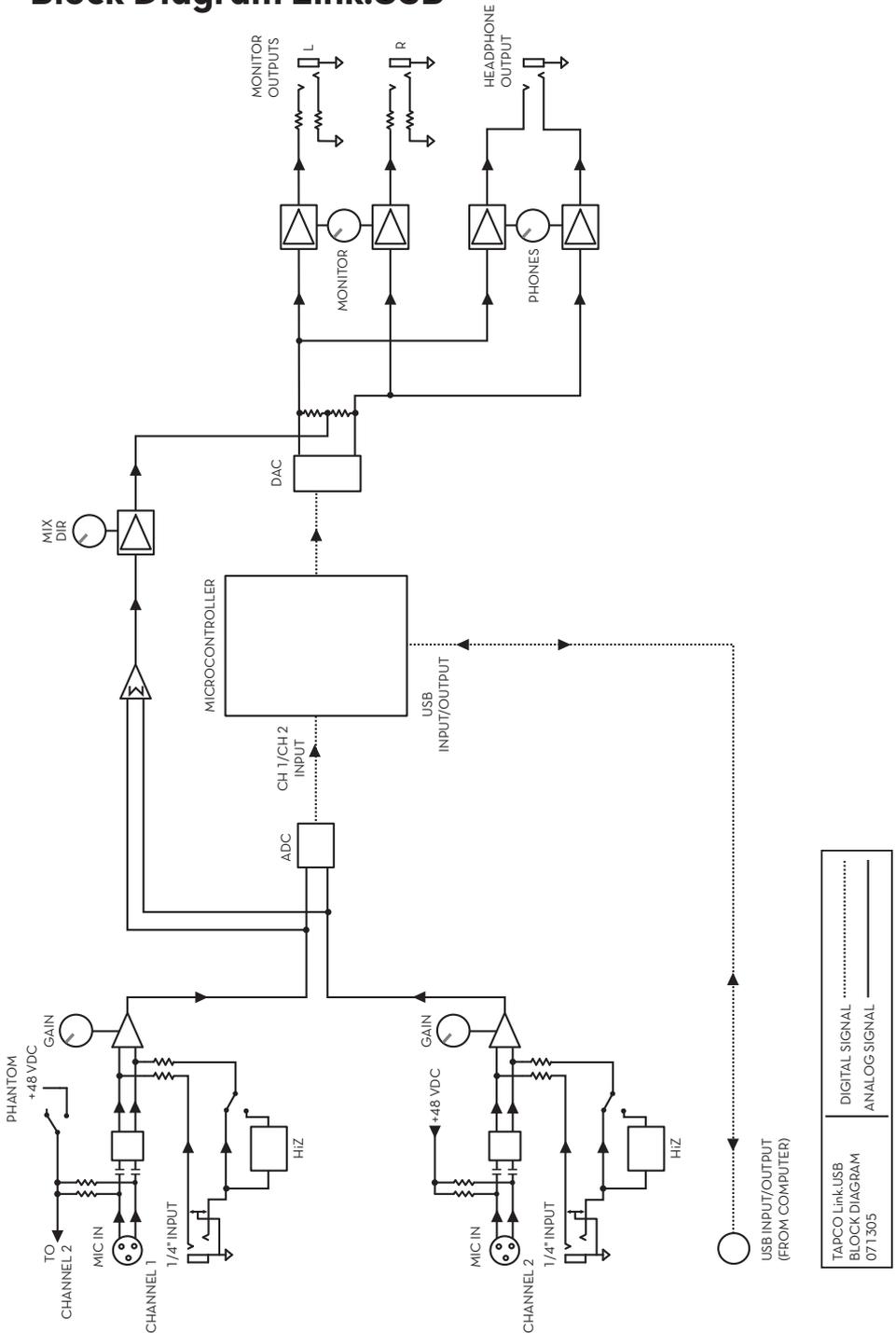
Disclaimer

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Block Diagram Link.USB



TAPCO Link.USB BLOCK DIAGRAM 071305	DIGITAL SIGNAL
	—————	ANALOG SIGNAL

What is Latency?

Latency describes the amount of time it takes the input signal to pass through the system, and reach the output. When recording a guitar and monitoring through software, it is the amount of time it takes from the moment you strike your guitar string, to the moment you hear it in your headphones. You are used to this latency being very close to zero; when you play your guitar through a guitar amp, you hear the signal immediately. So when you are recording and monitoring via software, you want this latency (delay time) to be as low as possible.

There are many factors that contribute to latency, and there is one in particular that you can control: the software audio buffer size. The audio buffer (also referred to as ASIO buffer on a PC, or Core Audio buffer on a Mac) is an area in memory that Tracktion uses to hold your audio as it works. The buffer size is measured in samples, and usually ranges from just a few samples to thousands. The smaller the buffer, the faster the audio gets in and out of your computer, and the lower the latency.

We would like to set this buffer as low as possible to achieve the lowest latency, but there is another factor to consider: The smaller the buffer, the harder your computer will have to work. To illustrate this, pretend you are given five minutes to move water from a large bucket to another bucket ten feet away. You must use either a large pint glass or a small whiskey glass to transfer the water. Which would you choose? The pint glass of course. If you choose the whiskey glass, you would quickly grow tired of running back and forth moving the small amount of water. Depending on your fitness and speed, you may not be able to move it all in five minutes. This is similar to how your computer deals with the audio buffer. If you choose too small a buffer, the computer needs to work very hard to quickly transfer the audio in and out of the buffer. It may not even be able to keep up, especially if you have lots of tracks, lots of automation and/or lots of plug-ins in your work. If this happens, your audio may stop or “drop out.” Drop outs at low buffer sizes may also occur if you have a slower computer or not enough memory.

For low latency and good performance from your system, it is best to adjust the buffer size to taste. You often need to use trial and error to find an acceptable buffer size. In Tracktion, this is done by choosing the Settings tab, choosing the Link.USB in the Wave Device drop down menu, and adjusting the Latency. Usually, a setting less than 256 samples will yield fine results, while a setting of 128 samples or less will be required for almost inaudible latency.

Note: While you are recording, low latency is often a priority. Mixing existing tracks on the other hand, does not often need such extremely small settings. Many users adjust their buffer setting between the tracking and mixing stage. Increasing the buffer size while mixing may allow you to run a few extra plug-ins; try 1024 or 2048 samples.

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- A. LOUD Technologies Inc. warrants all materials, workmanship and proper operation of this TAPCO product for a period of **one year** from the original date of purchase. If any defects are found in the materials or workmanship, or if the product fails to function properly during the applicable warranty period, LOUD Technologies, at its option, will repair or replace the product. **This warranty applies only to equipment sold and delivered within the U.S. by LOUD Technologies or its authorized dealers.**
- B. Failure to register online or return the product registration card will not void the one-year warranty.
- C. Service and repairs of TAPCO products are to be performed **only** at a factory-authorized service center. Unauthorized service, repairs, or modification will void this warranty. To obtain repairs under warranty, you must have a copy of your sales receipt from the authorized TAPCO dealer where you purchased the product. It is necessary to establish purchase date and determine whether your TAPCO product is within the warranty period.
- D. To obtain factory-authorized service:
1. Call TAPCO Technical Support at 877/827-2669, 7 AM to 5 PM Monday through Friday (Pacific Time) to get a Service Request Number. Products returned without a Service Request Number will be refused.
 2. Pack the product in its original shipping carton. Also include a note explaining exactly how to duplicate the problem, a copy of the sales receipt with price and date showing, and your return street address (no P.O. boxes or route numbers, please!). If we cannot duplicate the problem or establish the starting date of your Limited Warranty, we may, at our option, charge for service time.
 3. Ship the product in its original shipping carton, **freight prepaid**, to the authorized service center. The address of your closest authorized service center will be given to you by Technical Support.
- IMPORTANT: Make sure that the Service Request Number is plainly written on the shipping carton.**
- E. LOUD Technologies Inc. reserves the right to inspect any products that may be the subject of any warranty claims before repair or replacement is carried out. LOUD Technologies may, at our option, require proof of the original date of purchase in the form of a dated copy of the original dealer's invoice or sales receipt. Final determination of warranty coverage lies solely with LOUD Technologies Inc.
- F. TAPCO products returned to one of the LOUD Technologies factory-authorized service centers and deemed eligible for repair or replacement under the terms of this warranty will be repaired or replaced within thirty days of receipt. LOUD Technologies and its authorized service centers may use refurbished parts for repair or replacement of any product. Products returned to LOUD Technologies that do not meet the terms of this Warranty will not be repaired unless payment is received for labor, materials, return freight, and insurance. Products repaired under warranty will be returned freight prepaid by LOUD Technologies to any location within the boundaries of the USA.

- G.** LOUD Technologies warrants all repairs performed for 90 days or for the remainder of the original warranty period. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse, or to exterior appearance. This warranty is recognized only if the inspection seals and serial number on the unit have not been defaced or removed.
- H.** LOUD Technologies assumes no responsibility for the quality or timeliness of repairs performed by Authorized TAPCO Service Centers.
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