PBXport

Rackmount PBX
Digital Hybrid

User Guide

JK Audio

Introduction

PBXport will allow you to send and receive audio through your multi-line PBX, ISDN or analog telephone. While this may seem like a simple task, the challenge is getting the best quality audio from such a limited audio path.

What is a Digital Hybrid?
The PBXport digital hybrid connects audio signals to and from the handset side of a telephone without the variations in quality found with analog hybrids. The main function of a hybrid is to bring in the caller's voice from the phone line, as clear and clean as possible. In the real world, when you send your voice down the telephone line it has a tendency to bleed over into the caller's audio. The hybrid must adapt to the audio signals from the telephone in order to properly separate transmit and receive audio. We use a 16 bit DSP (Digital Signal Processor) to continuously monitor the audio signals from the telephone to deliver excellent separation. Our dual-convergence algorithm can achieve excellent trans-hybrid loss, also known as "separation".

Ready to go?
The PBXport controls and connectors are clearly marked and ready for operation. The feature diagram will help you pinpoint any minor questions that you may have. If this is your first exposure to a hybrid, we suggest that you read the entire manual to allow you to take advantage of all these features.

Any Questions?
Before you pick up the phone... Please thumb through the rest of this manual. You might find those deep technical questions are covered on later pages.

Safety Symbols used in this manual:

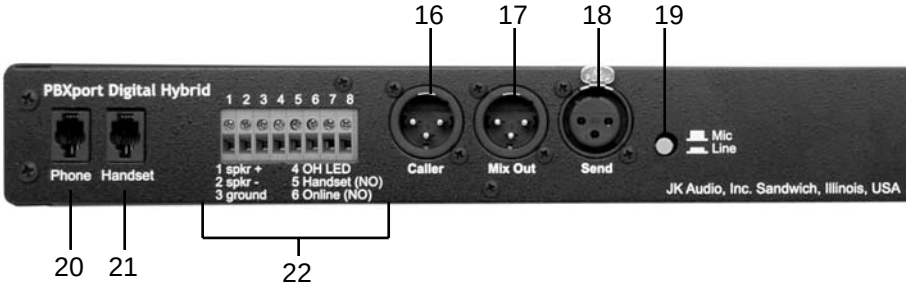
ATTENTION! - Alerts you to instructions for preventing a situation that could result in damage to the unit.

WARNING! - Alerts you to instructions for preventing a potentially hazardous situation that could result in bodily injury.

Features—Front View

1. Handset Button - Press this button to use the handset as on a normal phone call.
2. ON LED - Lit when you are online with a call using the digital hybrid.
3. Online Button - Press this button to disable the handset and activate the PBXport for use as a digital hybrid.
4. Send LEDs - Displays the signal level going out to the telephone line.
5. Send Level - Adjusts the signal level that you are sending down the telephone line, through the female XLR input.
6. Caller Level - Adjusts the level of the signal coming in from the telephone line, going out the output jacks.
7. Send>Mix Level - Adjusts the level of local Send audio going out the Mix output jack.
8. Mix<Caller Level - Adjusts the level of signal coming in from the telephone line, going out the Mix output jack.
9. Mix Monitor jack - 1/4" stereo headphone jack containing the same mix as the Mix output jack.
10. Mix Monitor Level - Adjusts the signal level of the 1/4" headphone jack and the speaker terminals.
11. Front Panel Handset Jack - Connect your telephone handset to this jack or the rear panel handset jack.
12. Front Panel Phone Jack - Connect the handset jack on your telephone base to this jack or the rear panel phone jack using the supplied handset jumper cable.
13. Power LED - Lit when the unit is plugged in and receiving power.
14. Receive LEDs - Displays the signal level coming from the phone line, after the DSP.
15. Handset Type Selector Switch - Use this switch to select the correct type of handset microphone that your telephone uses. A=Electret, B=Carbon, C=Dynamic.

Features—Rear View



16. Caller Output - Male balanced XLR output contains caller audio from the far side of the call.

17. Mix Output - Male balanced XLR output contains Caller and/or Send audio based upon Send>Mix<Caller volume control settings.

18. Send Input - Female balanced XLR input for signals going into the phone line. Mic or line level input. This jack does not provide phantom power.

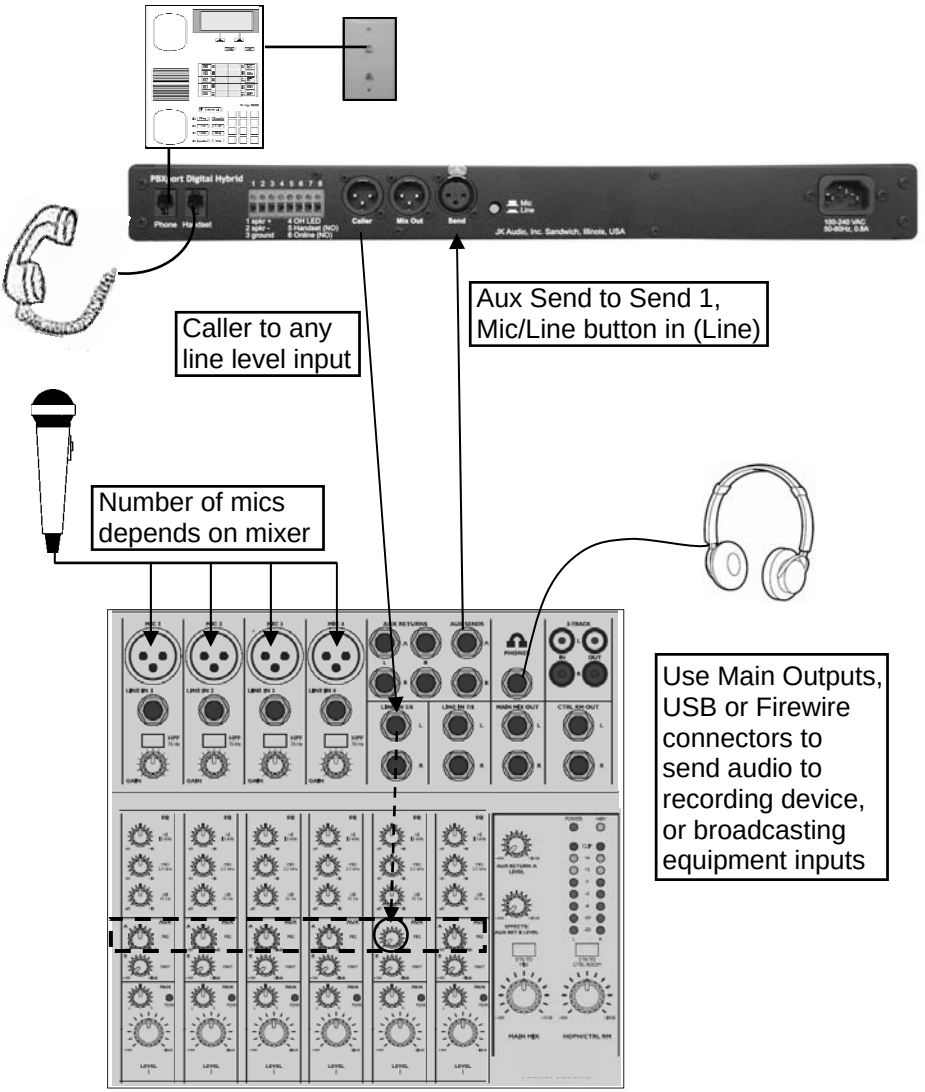
19. Mic / Line switch - Sets the front end sensitivity of the Send XLR input. Set to Mic if you intend to plug a microphone directly to the Send jack. Set to Line if you are connecting to the line output or auxiliary output of a mixer or other audio equipment.

20. Rear Panel Phone Jack - Connect the handset jack on your telephone base to this jack or the front panel phone jack using the supplied handset jumper cable.

21. Rear Panel Handset Jack - Connect your telephone handset to this jack or the front panel handset jack.

22. Screw Terminal Block - For speaker connection, remote LED status connection and remote Online / Handset control.

Connection—Mix-Minus Setup



For whichever input channel you have the Caller connected to, turn the corresponding Aux control to minimum (usually hard left). All other Aux controls should be set for what you want to send to the phone line. Each Aux Send bus is completely separate from all other outputs, so these Aux controls will not affect what is heard on the Main outputs or on any other Aux buses. This Aux Send bus should be pre-fader, so you can use the fader controls to set the levels of each channel to the main output.

Operation

Connecting Cables

Although each application will require a slightly different setup, standard configuration is as follows:

Handset cable - Connect the supplied RJ-22 handset cable between the jack marked "Phone" on the front or back of PBXport and to the handset jack on the base of your telephone.

Handset - Connect your telephone handset to the RJ-22 jack on the front or back of the PBXport marked "Handset". You must keep a handset connected at all times, even when you are not using it.

Send Audio - Connect a microphone directly or a mixing console mix-minus output to the Send jack on the PBXport. Be sure to set the PBXport mic/line switch to the proper position for your application. Mic = microphone connected directly, Line = line level output from your audio equipment. More about mix-minus on page 5.

Caller Audio - Connect the Caller Out jack to a line level input on your mixing console or audio equipment.

Power - Connect the supplied AC power cable to the back of the PBXport and then to an AC power outlet.

Your PBXport is now ready to take calls.

PBXport will disable the telephone handset microphone when you press the Online button. Use your telephone to place or screen a call. When you are ready to take the call on PBXport, simply press the Online button. Make sure you do not put the handset back in it's cradle while you are on a call. This will still drop the call even though the handset itself is disabled. If you need to take the call back on your telephone, simply press the Handset button on PBXport. This will disable

the Mix<Caller and Caller output on PBXport and connect your handset back to the telephone. Any audio sent into the Send input will still be active on the Mix output based upon your settings.

Send Signal Level

The Send LEDs display the signal level as it goes out over the phone line. The goal is to drive the phone line at high enough levels to avoid phone line noise, but not so loud as to cause excessive clipping. Adjust the send level control until you see occasional flashes of the red -3dB peak Send LED. These flashes should occur during loud speech bursts only. If the red LED stays lit for extended periods you can assume that much of your speech is being clipped or distorted. In this case you should back down on the Send volume control or the mixer output that is causing the clipping.

Receive Signal Level

The receive LEDs display the signal coming from the phone line and out of the DSP. The Caller level control does not change what you see on these LEDs. Adjust the Caller level control to give you the best signal level at the output XLR. If your telephone has an adjustable receiver volume control, you should set this control to the "normal" position. If you attempt to boost the level of the caller's voice using the handset volume control on your telephone, you may cause PBXport to become unstable. This instability would be caused by the increased level of the transmit signal that becomes mixed with the caller's voice.

Headphone Mix

The 1/4" headphone jack on the front of PBXport is used for monitoring your call. This stereo jack contains a mix of both sides of the conversation on each headphone channel. The levels of this mix are determined by the Send>Mix<Caller volume controls. The overall audio level from this jack is determined by the Mix Monitor volume control.

A-B-C Selector Switch

Use this switch to select the correct type of handset microphone that your telephone uses. A=Electret, B=Carbon, C=Dynamic. Trial and error seems to work best in determining which handset type to use. Your PBXport will only function correctly if the handset type selector switch is in the correct position. This switch changes signal level, impedance, and wiring to accommodate the differences in handset microphone types.

In order to determine the correct position, you must place a call to a nearby telephone, then try to send audio into the PBXport through the inputs. While doing this, switch between the three different handset type positions. Choose the position that works best by monitoring the audio quality and send LED's. You may need to readjust the Send audio level for each setting.

Although not conclusive, the following guidelines may help:

The majority of newer telephones have electret type microphones and will use the "A" position.

Older telephones that have the round "screw-on type" handsets contain carbon microphones and use the "B" position.

Many Radio Shack®, Panasonic®, and Nortel® telephones have dynamic microphone types and use the "C" position.

Optional Jumper Settings

If your unit was purchased after December 2007, there are two jumpers located on the circuit board inside the PBXport that affect your incoming audio. The jumper at **J10** allows you to completely disable both the handset microphone and speaker when the Online button is pressed. The factory default closed position disables only the handset microphone when the Online button is pressed. This will have no affect on normal telephone operation.

If the incoming audio level from your telephone is too high and you are consistently lighting the red –3 dB Receive LED, first try decreasing the volume using the controls on the base of your telephone. If you still cannot drop the incoming audio level enough, you may need to change jumper **J11**. There are three possible settings to adjust Caller Receive level:

Pins 1 & 2 closed = 0 dB (factory default)
Pins 2 & 3 closed = -10 dB
Pins 1-3 left open = -20 dB

To change the jumper settings, first disconnect power from the PBXport, then remove the top cover on the unit. Locate the appropriate jumper on the printed circuit board and set to the desired position.

WARNING! *The AC cable must be unplugged from the back of PBXport anytime the case is opened. Failure to follow these instructions could potentially result in injury or death.*

ATTENTION! *Be sure to use an ESD grounding wrist strap when changing this jumper setting. If you do not have a wrist strap, keep one hand on the PBXport case at all times while changing the jumper with the other hand. These measures are required to prevent electrostatic discharge from damaging the unit.*

FAQs

? Will PBX Port work with my _____ PBX phone system?

! Probably yes. We have to say probably because the handset interface is proprietary and therefore can change from model to model. We have no way of predicting how a phone manufacturer will use the handset wires in the future. The three handset microphone types that we support, electret, dynamic, and carbon, cover every handset microphone type that we have seen in use, but the wire diagrams can change without notice.

? Can PBX Port auto-answer or auto-disconnect?

! No, the handset cord on your telephone is only active when the handset is off-hook. This is done manually. There is no way then to auto-disconnect. You must return the handset to the cradle.

? Why can't I dial out on my phone? or I hear a lot of noise on the call?

! PBX Port will not work with any telephone that has a keypad in the handset. You need to use a telephone with a standard handset.

? I have everything connected correctly. Why can't the caller hear me?

! This could be one of two things. First, check the position of the A-B-C switch. Most phones use either setting A or C. If you cannot send any audio with setting A, you should use setting C.

Also, you cannot use the speakerphone function on your telephone during your recording. PBX Port accesses the audio path through the handset cord. With the speakerphone turned on, there is no audio going to the handset.

FAQs

? How do I connect a call through PBXport? Every time I press the "Online" button, the call is disconnected.

! If you put the handset back in the cradle on the telephone, it will depress the hook flash button on the phone and your call will be disconnected. You should set the handset down beside the telephone and only return it to the cradle after your call is completed. You need to leave the handset connected to one of the Handset jacks on PBXport to maintain the correct impedance for your telephone.

? The PBXport is not providing any/enough separation of Send and Caller audio.

! The A-B-C handset type selector switch must be set to the correct position to send audio into the telephone. Setup for this is covered on page 8. If you are connecting the PBXport input and output(s) to the same device, you must send a "mix-minus" signal into the Send jack from your equipment. This setup is covered on page 5.

? Will PBX Port provide phantom power for my condenser microphone?

! No, our devices will not provide phantom power. If you are connecting your microphone directly to PBX Port, you should use a dynamic mic.

Other Information

Screw Terminal Block

1 - Speaker (+) Minimum 8 ohms, 1 watt max

2 - Speaker (-) Use together with terminal 1

3 - Ground

4 - OH LED Supplies +4.3 VDC, 40 mA steady signal during an Online call.

5 - Online (NO) Pull this pin to ground momentarily to simulate pressing the Online button.

6 - Handset (NO) Pull this pin to ground momentarily to simulate pressing the Handset button.

Contact your JK Audio dealer for additional information.

Helpful Hints:

PBXport will not work with any telephone that has a keypad in the handset.

If using a mixer you must use a "mix-minus" signal to the Send input (Page 5)

You must set the A-B-C switch to the correct handset type position for your particular telephone. (page 8)

You may use either front or back panel handset jacks but not simultaneously.

Don't overdrive the Send input. Flashes of the -3 Red Send LED indicate distortion, clipping and reduced separation.

If your telephone has an adjustable receiver volume control, you should set this control to the "normal" position. If the Receive audio meter on the PBX port is showing the red –3 dB LED, you should turn down the volume on the base of your telephone until you see only green LEDs.

Specifications

Inputs:

Send Input:	Female XLR 1 k ohm, 10 mV RMS nom. (-38 dBu nom.) Mic/Line pad switch Line = +5 dBu nom.

Outputs:

Caller Out:	Male XLR 200 ohms, 500 mV RMS nom. (+14 dBu Max output)
Mix Out:	Male XLR 200 ohms, 500 mV RMS nom. (+14 dBu Max output)

Headphone:	1/4" Stereo 8 ohms, 250 mW per channel.
Speaker:	Screw Terminals 8 ohms, 1 watt max
Handset Connectors:	RJ22
Phone Base Connectors:	RJ22
Power:	100-240 VAC, 50-60 Hz
Isolation:	1500 VAC
Size:	19" x 7.3" x 1.75" (48.3 x 18.6 x 4.5 cm)
Weight:	5.4 pounds (2.4 kg)

FCC Part 15 Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, 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 environment. 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.

Changes or modifications not expressly approved by JK Audio can void the user's authority to operate the equipment.

FCC Registration

Your new JK Audio product has been registered with the Federal Communications Commission (FCC). This product complies with the standards in Part 68 of the FCC rules.

1. **Connection and use with the nationwide telephone network**
   The FCC requires that you connect this telephone equipment to the national telephone network through a USOC RJ-11C modular telephone jack.
   This equipment may not be used with Party Line Service or Coin Telephone Lines.
   This equipment is hearing aid compatible.

2. **Information for the telephone company**
   Upon request from your local telephone company, you are required to provide the following information:

   a) The "line" to which you will connect the telephone equipment (that is, your telephone number), and

   b) The telephone equipment's FCC registration number.

This can be found on the bottom of your telephone equipment, and,

c) the ringer equivalence number (REN) for this equipment. The REN is used to determine the quantity of devices which will be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed 5.0. To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the local telephone company.

3. Repair Instructions

If it is determined that your telephone equipment is malfunctioning, the FCC requires that it not be used and that it be unplugged from the modular outlet until the problem has been corrected. Repairs to this telephone equipment can only be made by the manufacturer or its authorized agents or by others who may be authorized by the FCC. For repair procedures, follow the instructions outlined under the warranty section of the manual.

4. Rights of the telephone company

If telephone equipment is causing harm to the network, the telephone company may temporarily discontinue your telephone service. If possible, they'll notify you before they interrupt service. If advanced notice isn't practical, you'll be notified as soon as possible. You'll be given the opportunity to correct the problem, and you'll be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your JK Audio product. If such changes are planned, you'll be notified by your telephone company.

Warranty

PBXport is covered by a 2-year warranty to be free from defective workmanship and materials. In the event that the PBXport needs repair, you must call us to get an authorization, and then carefully pack and ship it to us. You will pay for shipping to us and we will pay for return back to you, UPS ground. No free repairs will be made if the defect was caused by misuse, weather conditions, or other cause, except for defective workmanship or materials.

THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTY HERE MADE.

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