# USB-XIII
Audio Interface

USER MANUAL

PLAYBACK
DESIGNS

IMPORTANT SAFETY INSTRUCTIONS

- Read and follow these instructions and keep this manual in a safe place.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not install near any heat sources such as radiators, heaters, or other apparatus (including pre-amplifiers and amplifiers) that produce heat.
- Unplug this apparatus from the mains during lightning storms or when unused for long periods of time.

CAUTION

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RISK OF ELECTRIC SHOCK
DO NOT OPEN
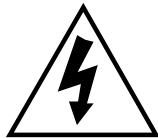
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
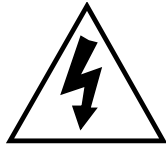
The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARRANTY

Playback Designs warrants the USB-XIII product against defects in material and workmanship under normal use and service for a period of time specified by the product's serial number from the date of first delivery to the owner. The warranty time period is for 30 days. If within the first 30 days of ownership you register your Playback Designs USB-XIII product, by sending us a copy of your sales receipt, your name, address, city, state, zip code, phone number, email address and your dealer's store name, we will extend the warranty to 3 years. This warranty is limited to the original owner.

Playback Designs will pay for return shipping charges (domestically) back to the owner when the product is sent to Playback Designs within the first 30 days after purchase and the fault can be confirmed by Playback Designs. Otherwise, owner will be responsible for all shipping charges to and from Playback Designs. International customers must deal with their local dealer or distributor.

For all warranty claims, a copy of the original invoice must accompany the product.
Opening the product or modifying it in any way by the owner, including but not limited to cryogenic treatment, will void any warranty.

Please contact Playback Designs with a clear trouble report and for shipping instructions before shipping any product to Playback Designs.

Playback Designs products are sold worldwide through authorized dealers with restricted territories. If any Playback Designs product is purchased from non-authorized dealers or from a dealer selling outside his / her authorized territory all warranties will be void.

Alteration or modification carried out without appropriate approval may invalidate the user's right to operate the equipment.

BEFORE USING THE PRODUCT

- What is in the box: USB-XIII interface
                             Universal power supply
                             USB cable
                             Optical PlayLink cable. When you need to replace this cable or use additional ones, only use ST-ST 62.5/125 multimode fiber optical cable types.
                             User manual

- Registration   If you purchased this product from a dealer please take a moment and send us an email to info@playbackdesigns.com so we can register you for the warranty.

- Installation: The AC voltage supplied to the power supply should match the voltage rating indicated on it.
                             Do not place the USB-XIII interface on any other equipment that generates heat.

FRONT SIDE

RST Button to reset entire interface (same function as power cycle)

INPUT Audio input selector
     Up: selects PLink input in "classic" format (as supported by 5-series of classic products)
     Middle: selects USB input
     Down: select PLink input in "Sonoma" format (as supported by all Sonoma and upgraded
     IPS-3 products)

MODE These 4 toggle switches define the following modes of operation:
     1: up: USB operates in 6-channel mode (not available for quad DSD format)
       down: USB operates in stereo mode

     2: up: optical PLink output format is "Sonoma"
       down: optical PLink output format is "classic"

     3: up: DSD is encoded in DoP for AES output (limited to DSD1x)
       down: DSD is encoded in proprietary format for 3-series products

     4: not used yet

POWER Power input: 8V - 12V DC

USB USB audio input and output

AUX Not used yet

LED This LED can have 3 colors with the following meaning:
     Green: normal operation
     Amber: firmware is being updated - do not interrupt this process or remove power
     Red: an error occurred during the firmware update process. Do not remove power and
       follow instructions precisely in section that explains the procedure for firmware
       upgrade in this manual.

LOCK This LED lights up green if a valid input signal is detected at the selected digital input.

BACK SIDE

AES / DoP OUT	This XLR output connector sends out PCM data from the selected input up to 192kHz. 8FS (352.8kHz and 384kHz) input signals are downsampled to 4FS. DSD signals are either sent out natively or in proprietary format (see mode switch 3 on front side).
COAX / DoP OUT	Same as AES OUT
PLINK OUT	These three 2-channel output connectors are used for stereo and 6-channel setups. The PLink format can be selected with mode switch 2 ("Sonoma" or "classic"). FR L/R: PLink audio signals for front left and right (use this for normal stereo operation) C/LFE: PLink audio signals for center and low-frequency channels SR L/R: PLink audio signals for left and right surround channels
PLINK IN	PLink input connector. The format of this input can be selected between "Sonoma" or "classic" (see input selector on front side).

THE OPTICAL PLAYLINK (PLINK) CONNECTION

There is no digital audio interface standard supporting all sample rates for PCM and DSD. There are many different interfaces, but none support universally all the high resolution formats. Therefore, unsupported sample rates need to be converted in order to fit through a standard digital interface. In order to not compromise quality through unnecessary conversion algorithms Playback Designs has developed a proprietary optical interface to not only support all PCM and DSD formats, but to also offer a galvanic isolation between digital source and sensitive analog circuitry in a DAC.

Playback Designs pioneered this interface already in 2007 ("classic" PLink). At the time even double rate DSD seemed a distant reality and so it seemed reasonable to define the PLink interface for PCM up to 384kHz and DSD up to 5.6MHz.

In the meantime, technology advanced, quad DSD (11.2MHz) made its entry in recording studios and first recordings are available in this new format. Playback Designs kept pace and updated the PLink interface format to include quad DSD. All new products in the Sonoma line support this updated PLink interface, hence the name for it "Sonoma".

The USB-XIII interface understands both PLink formats, classic and Sonoma. Depending on what it is connected to, the PLink format needs to be selected (see above explanation of switches).

PLAYING FILES FROM COMPUTER TO MPS-5 / MPD-5 VIA USB

In this application the UBS-XIII is used to connect the 5-series product to a computer to use it as a DAC for high resolution file playback. All sample rates are supported natively for PCM up to 384kHz and DSD up to 11.2MHz and are indicated on the front panel display as they are detected.

Since the 5-series products only support classic PLink the UPS-XIII performs the first step of the D/A conversion for quad DSD and sends an intermediate result via PLink to the DAC where the second step is performed. This 2-step process is the same as if the entire process was performed inside the DAC.
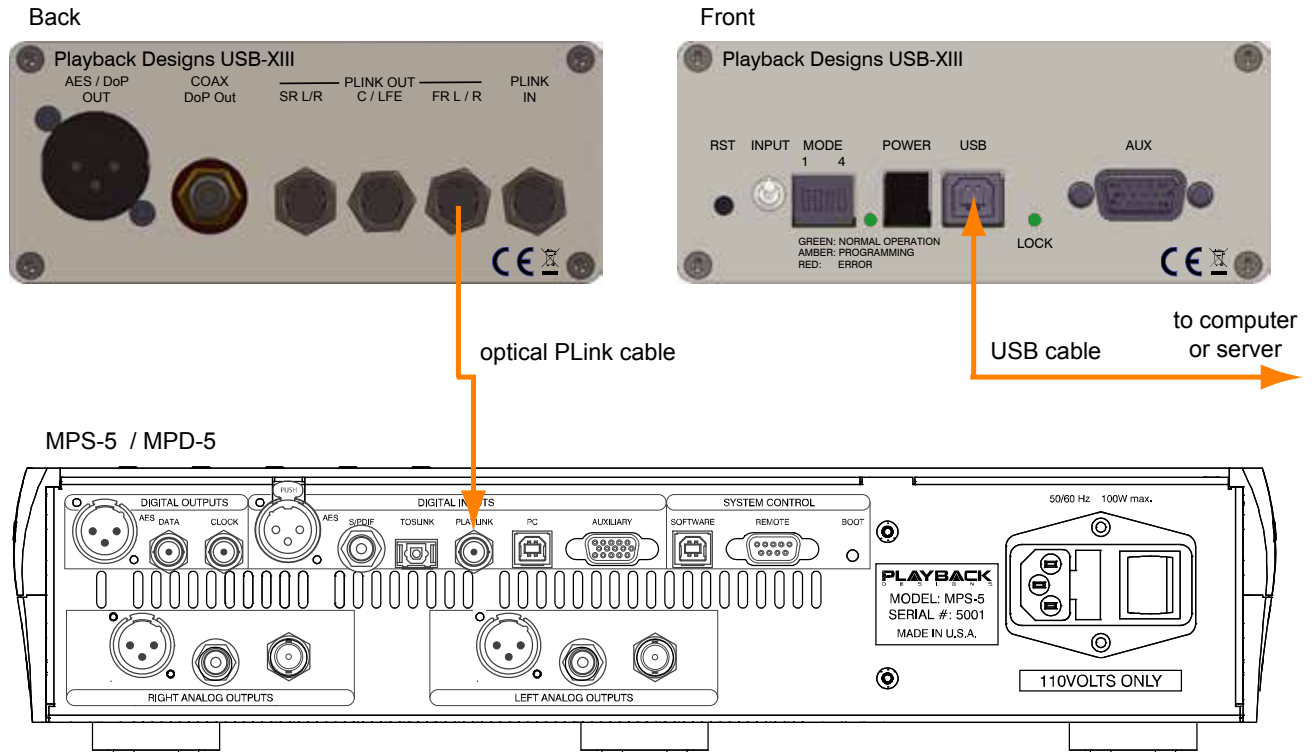
optical PLink cable

USB cable

to computer or server

Settings for USB-XIII

INPUT   middle position

MODE 1   down for stereo operation

MODE 2   down for classic PLink output

MODE 3   not used

MODE 4   not used
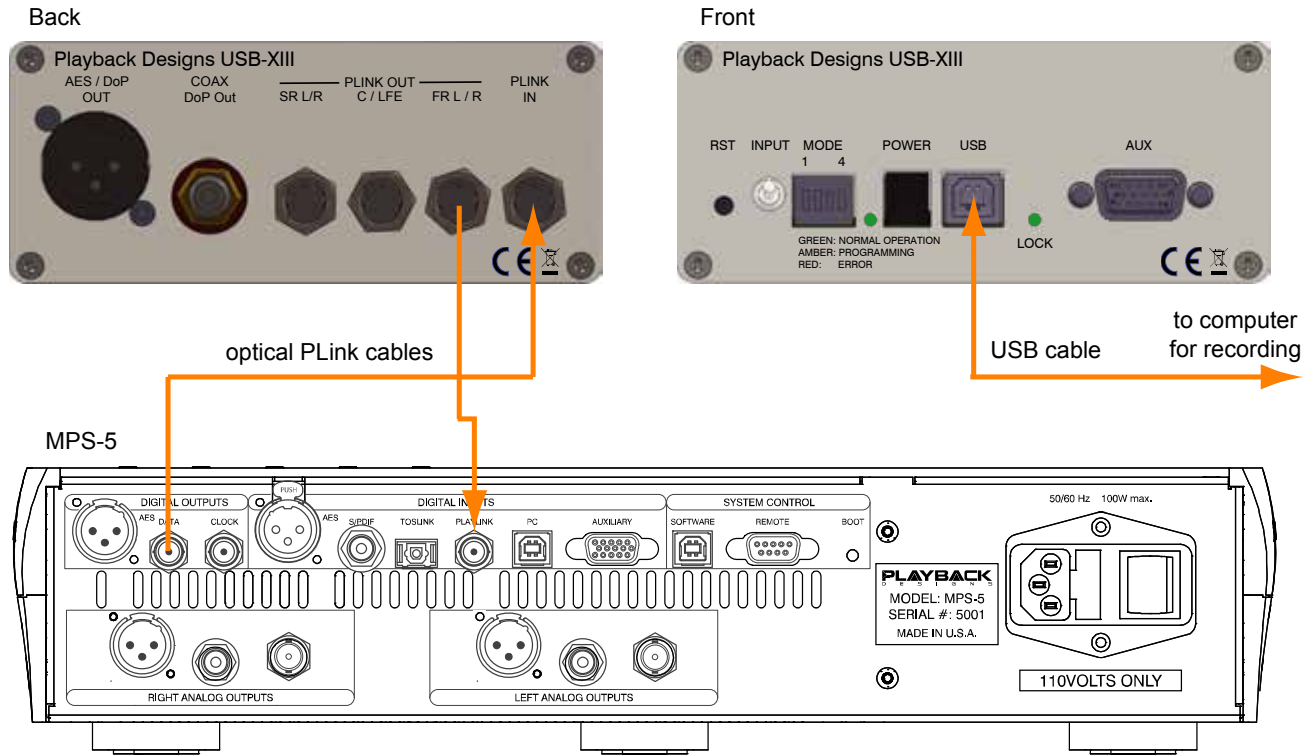
Settings for MPS-5 or MPD-5

Firmware   version 029 or higher

PLINK IN   PLink (this sets it to "classic")

Input   select PLink on remote

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

RECORDING FROM MPS-5 TO COMPUTER VIA USB

In this application the UBS-XIII is used to connect the MPS-5 player to a computer to use the Sonoma Recorder software (or any other 3rd party software) to create digital files from music being played on the MPS-5. All sample rates that are supported by the MPS-5 are supported natively for PCM and DSD for bit perfect file creation.

Settings for USB-XIII

INPUT	up position during recording middle position during playback
MODE 1	down for stereo operation
MODE 2	down for classic PLink output
MODE 3	not used
MODE 4	not used

Settings for MPS-5

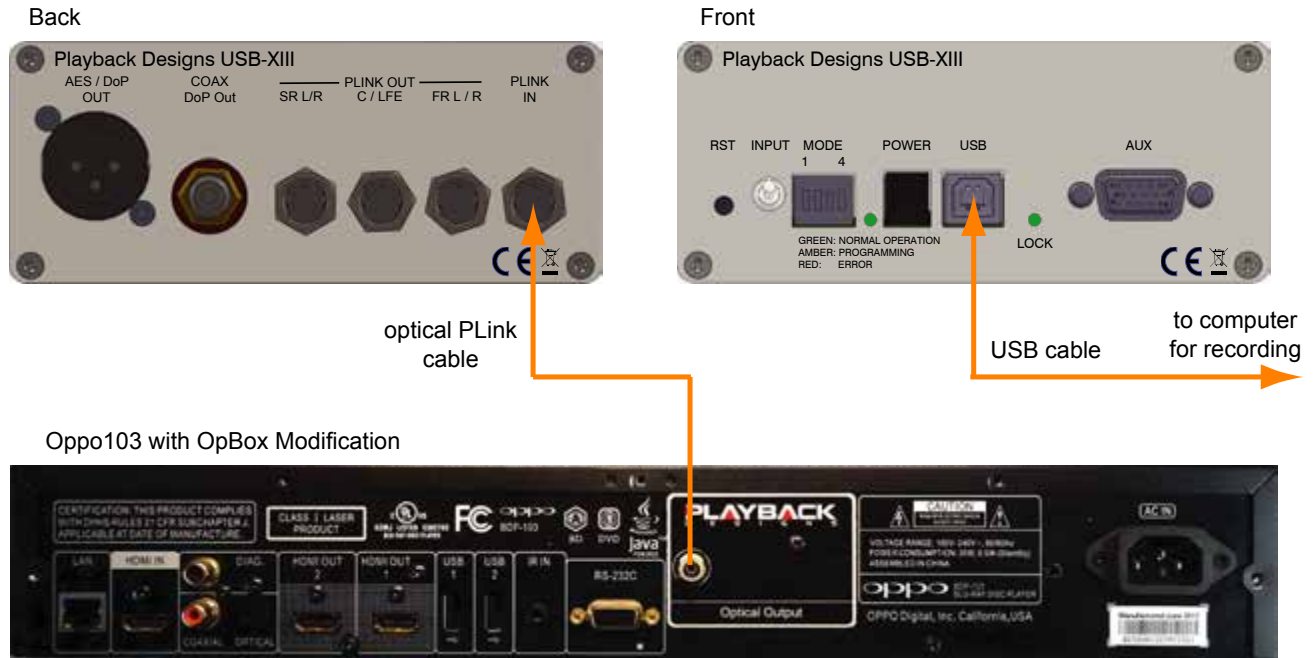|	
Firmware	version 029 or higher
PLINK OUT	PLink
PLINK IN	PLink (this sets it to "classic")

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

NOTE: Before you can start recording you need to verify that the sample rate in the recording software is set to the same rate as the audio being played on the MPS-5.

For recording you need to move the INPUT selector switch to the UP position and select your digital source on the MPS-5 (for instance DISC). After recording you can play your recorded file by flipping the INPUT switch to the middle position and selecting the MPS-5 PLink input via its remote.

RECORDING FROM OpBox TO COMPUTER VIA USB

In this application the UBS-XIII is used to connect the Oppo103 player with the OpBox Modification to a computer to use the Sonoma Recorder software (or any other 3rd party software) to create digital files from music being played on the Oppo103. All sample rates that are supported by the Oppo103 are supported natively for PCM and DSD for bit perfect file creation.

Back   Front

optical PLink cable

to computer for recording

USB cable

Oppo103 with OpBox Modification

Settings for USB-XIII

INPUT   down position

MODE 1   down for stereo operation

MODE 2   not used

MODE 3   not used

MODE 4   not used

Settings for OpBox

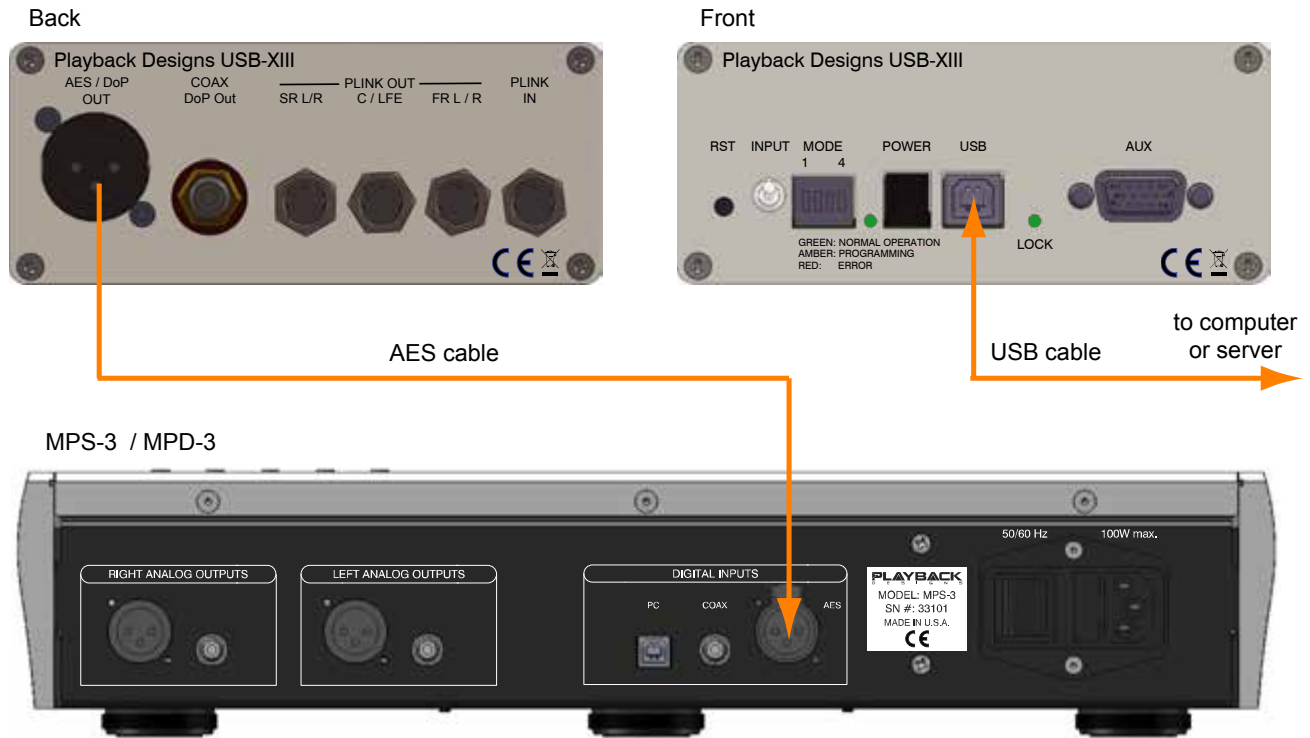PLINK OUT   Select Sonoma format

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

NOTE: Before you can start recording you need to verify that the sample rate in the recording software is set to the same rate as the audio being played on the Oppo103 player (for SACD select 2.8MHz).

PLAYING FILES FROM COMPUTER TO MPS-3 / MPD-3 VIA USB

In this application the UBS-XIII is used to connect the 3-series product to a computer to use it as a DAC for high resolution file playback. All sample rates are supported natively for PCM up to 384kHz and DSD up to 11.2MHz. 8FS PCM files (352.8kHz or 384kHz) are converted to 4FS to be able to transmit them via standard AES.

Since the AES interface has a limited bandwidth the UPS-XIII performs the first step of the D/A conversion for double and quad DSD and sends an intermediate result via AES to the DAC where the second step is performed. Single rate DSD is transmitted to the 3-series product via the DoP mechanism which is not a conversion, simply a bit perfect packing scheme.

Settings for USB-XIII

INPUT   middle position

MODE 1   down for stereo operation

MODE 2   not used

MODE 3   down for 3-series pre-process

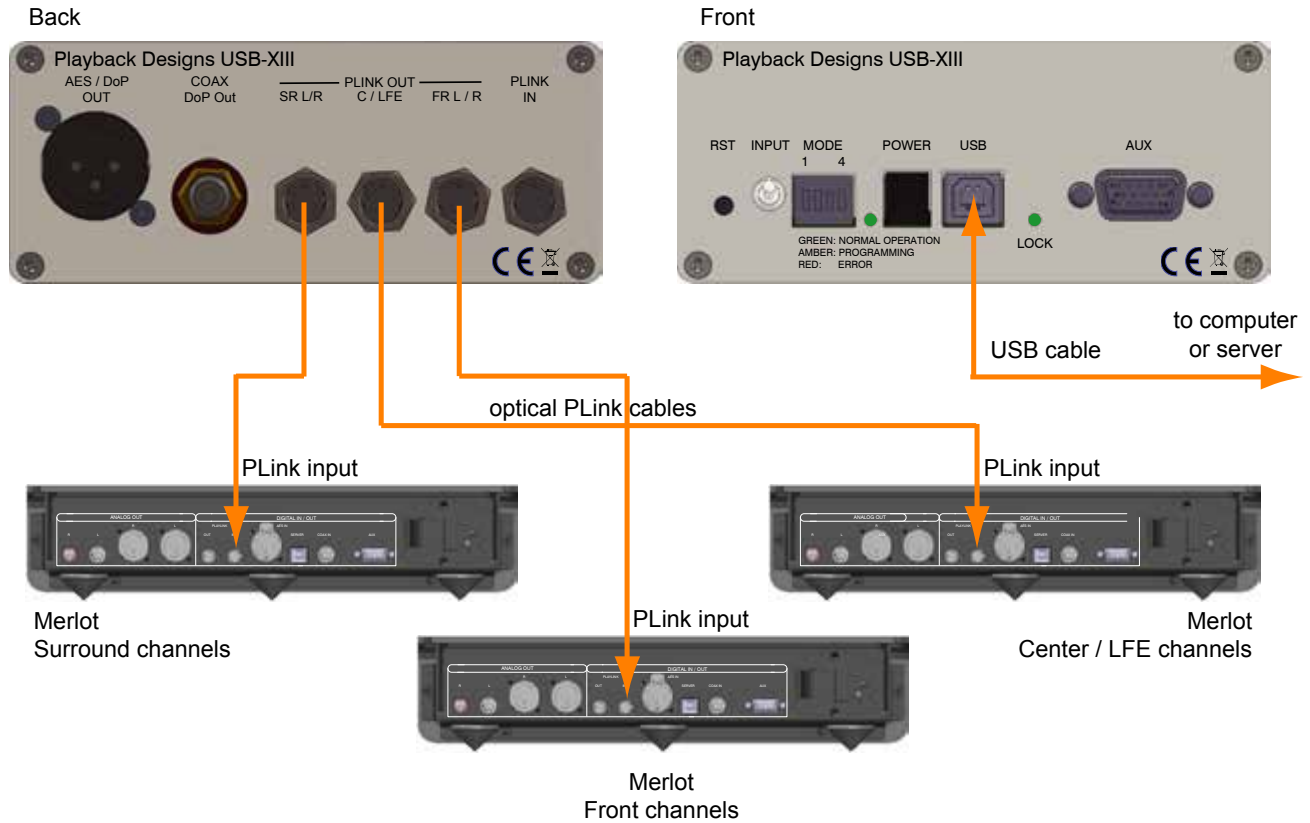MODE 4   not used

Settings for MPS-3 or MPD-3

Firmware   version 022 033 or higher

Input   select AES on remote

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

6-CHANNEL PLAYBACK FROM COMPUTER USING MERLOT DAC

In this application the UBS-XIII is used to connect up to three Merlot DACs to a computer or server for 6-channel playback via USB. This mode supports all PCM sample rates up to 384kHz and DSD up to 5.6MHz. Quad DSD is not supported for 6 channels as it exceeds the packet size of USB.

Settings for USB-XIII

INPUT	middle position
MODE 1	up for 6-channel operation
MODE 2	up for Sonoma format
MODE 3	not used
MODE 4	not used

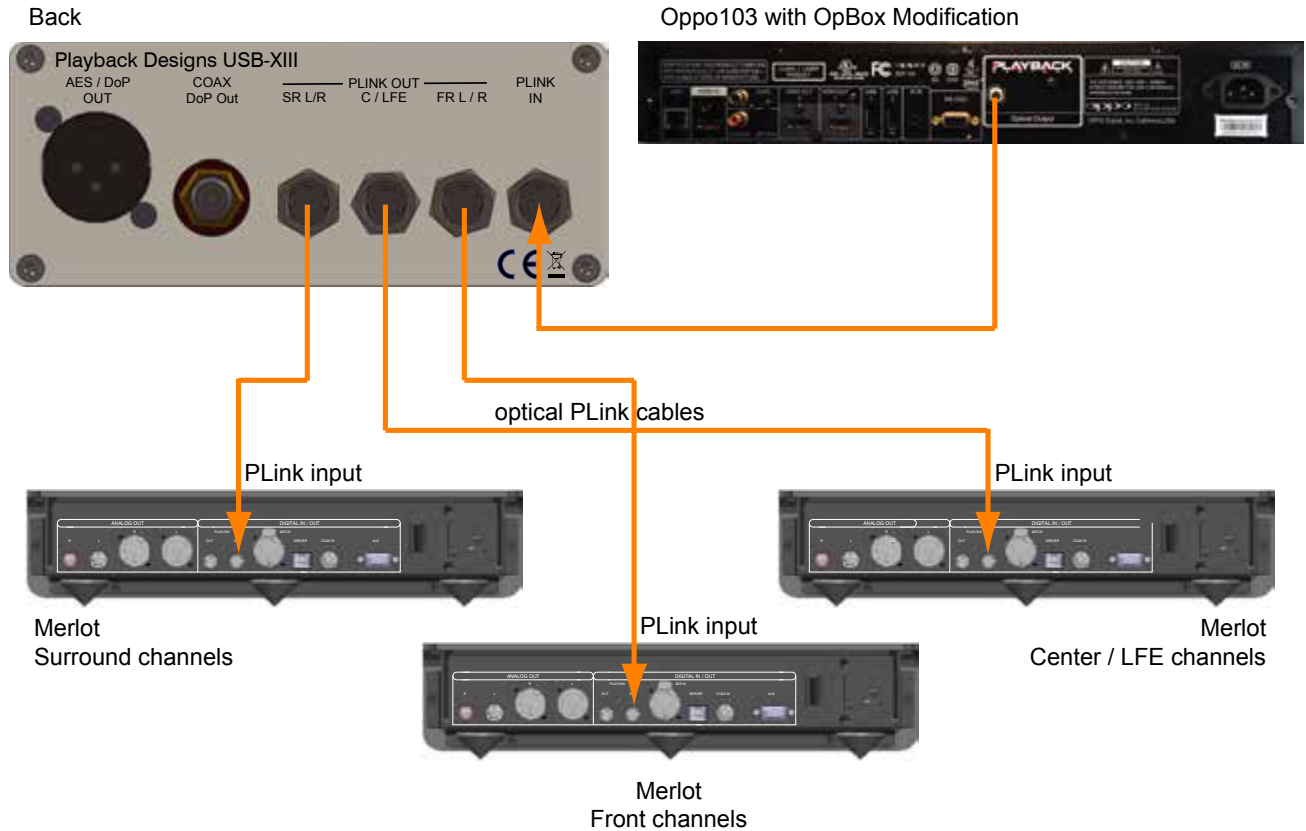## Settings for Merlot

Firmware	version 014 or higher
Input	PLink on all 3 units

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

If you need additional optical cables than provided, only use ST-ST 62.5/125 multimode fiber optical cable types.

6-CHANNEL PLAYBACK FROM OPPO PLAYER USING MERLOT DAC

In this application the UBS-XIII is used to connect up to three Merlot DACs to the Oppo103 player with the OpBox Modification for 6-channel playback. This mode supports all PCM sample rates up to 384kHz and DSD up to 5.6MHz.

Back   Oppo103 with OpBox Modification

optical PLink cables

PLink input   PLink input

Merlot   Merlot
Surround channels   Center / LFE channels

PLink input

Merlot
Front channels

Settings for USB-XIII   **Settings for OpBox**

INPUT   down position   PLINK OUT   Select Sonoma format

MODE 1   up for 6-channel operation

MODE 2   up for Sonoma format

MODE 3   not used
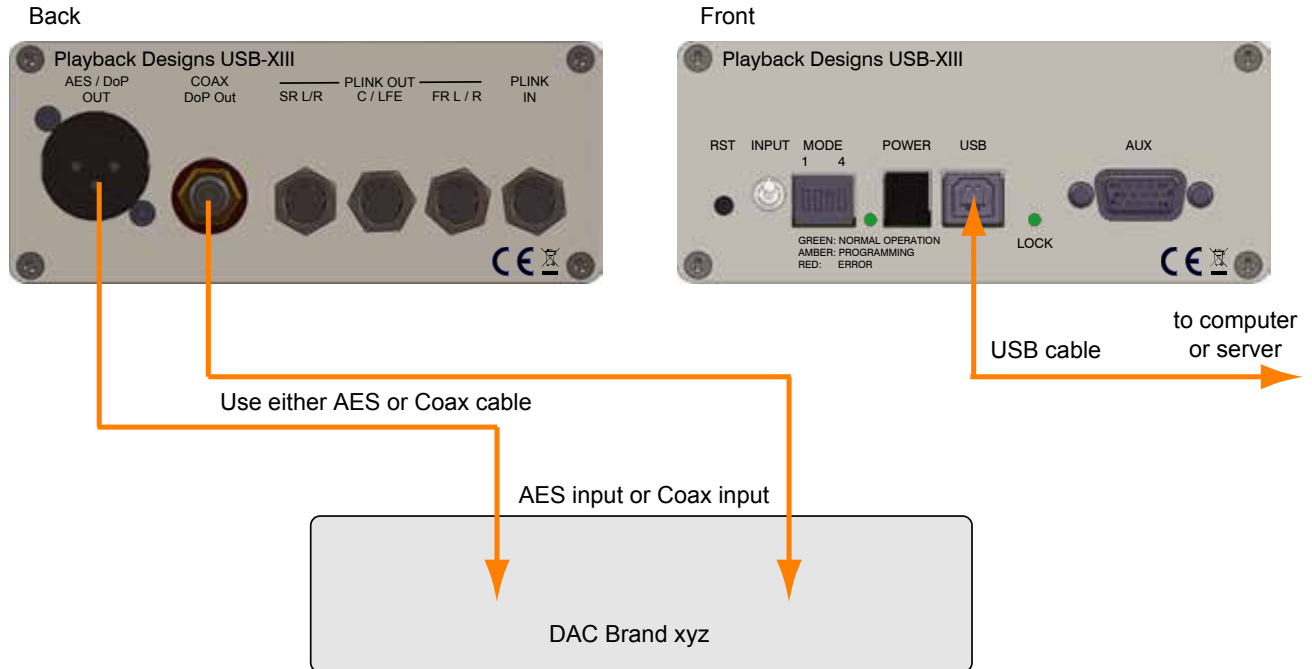
MODE 4   not used

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

If you need additional optical cables than provided, only use ST-ST 62.5/125 multimode fiber optical cable types.

PLAYING FILES FROM COMPUTER TO NON-PBD DAC VIA USB

In this application the UBS-XIII serves as a high quality USB interface for DACs from other manufacturers. All sample rates are supported natively for PCM up to 384kHz and DSD up to 11.2MHz. 8FS PCM files (352.8kHz or 384kHz) are converted to 4FS to be able to transmit them via standard AES or Coax. Likewise double and quad rate DSD files are converted to single rate DSD before packing them in DoP for AES or Coax output.

If the connected DAC does not support DSD via DoP then silence will be heard.

Settings for USB-XIII

INPUT   middle position

MODE 1   down for stereo operation

MODE 2   not used

MODE 3   up for DoP packing of DSD

MODE 4   not used

NOTE: after changing the MODE switches it is important to either press the reset button or to turn power off and on again.

CONNECTING USB-XIII TO A WINDOWS BASED PC or APPLE MAC

Supported PCM audio resolutions: all sample rates up to 384kHz and word lengths up to 24 bits.

Supported DSD audio resolutions: 2.8224MHz (as on SA-CD), 5.6448MHz (double) and 11.2896MHz (quad).

Connection protocol and method: USB 2.0 / Audio class 2.0 compliant, asynchronous mode where USB-XIII generates high precision clock master and computer is clock slaved.

PC requirements: Windows 8 or later
ASIO compatible playback and/or recording software such as Sonoma (by Playback Designs), VinylStudio (by AlpineSoft.co.uk) etc.

In order for your computer to communicate with the USB-XIII and to exchange audio data a custom driver software needs to be installed before you can connect it to the USB-XIII interface.

Mac requirements: OS X (10.6.6 or later). This platform only supports PCM format. For DSD the DoP mechanism can be used, but it requires a playback software that can implement DoP.

Driver software installation and first time connection:
1. Do not connect the USB-XIII to the computer yet.

2. Turn on your computer.

3. Windows PC users only: Launch your favorite internet browser and navigate to the Support>Product Drivers page on our website **www.playbackdesigns.com**. Click on USB Windows Driver to download the latest driver:
   - akdesigndrv.zip for PC. Unzip it to the desktop.
   - No driver software is required for the Mac platform.

4. Windows PC users only: Double click on:

   akdesigndrv.exe (PC)

   and follow the instructions on your screen. This will install the driver necessary to communicate with the Playback Designs products via USB.

5. Once your computer is properly configured, power on the USB-XIII.

6. Connect the included USB cable between USB-XIII and your computer.

7. The computer will take a moment to enumerate the USB-XIII on its USB bus and notify you when it is installed successfully. Do not attempt to play or record anything before the computer tells you that the device is ready to use. You can check successful driver installation and connection:

- On the PC in the device manager (below), where the driver will show up as AKDesign USB Audio under the Sound, Video and Game Controllers tab. It will not be listed in the Sound Control panel

- on the Mac in the Sound Control panel (below), where the USB-XIII should be listed as an audio input and output device
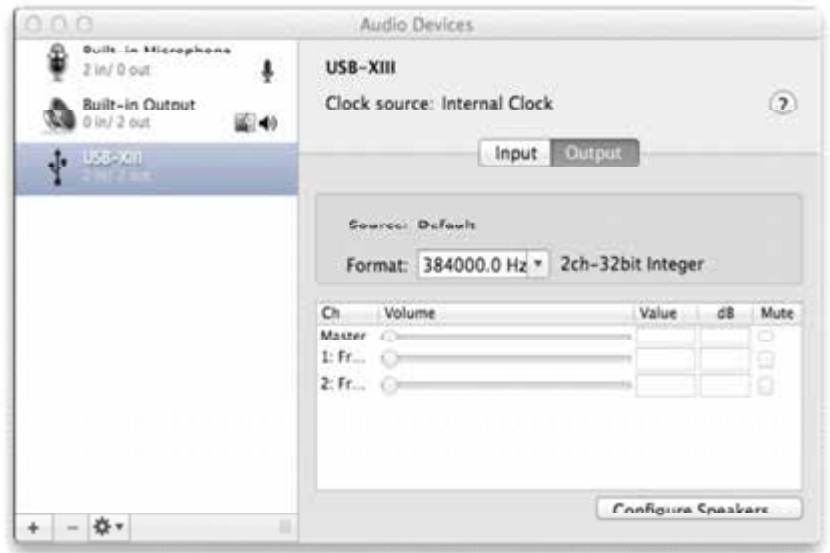
8. For PC users only: Configure your recording software to receive and send audio data from and to the ASIO interface. Depending on your software this may be identified as "AKDesign USB ASIO" or simply as "ASIO".

9. For best performance and bit perfect reproduction make sure to set all volume controls in the computer software, Windows / OSX control panel to exactly 0db (wide open), turn off all operating systems sounds, effects or equalizer that might be running in your software or Windows / OSX. Control the volume only with your analog pre-amp.

Your system is now ready for high resolution playback and recording.

UPGRADING THE FIRMWARE IN THE USB-XIII INTERFACE

Playback Designs is constantly innovating new algorithms and methods for audio processing and from time to time may release new firmware for the USB-XIII interface that may further enhance the sonic performance or add new features. New releases will be distributed as audio wave files. They can be played into the USB-XIII just like any other audio file. The USB-XIII processor will automatically detect this file and update the firmware. No audio will be audible as the processor will automatically set the volume to 0.

Upgrade Procedure:

1. Power on USB-XIII.
2. Connect your computer with the included USB cable.
3. Load the wave file with the update firmware into your player software on your computer.
4. Play the file.
5. The front panel LED will turn from green to amber. It is important that at this point you no longer touch the system, nor your PC, don't change the input, don't turn the power off. Go have a glass of Playback Designs wine, because it will take about 2 minutes for this to finish.
6. Once playback has finished the front panel LED will return to green indicating a successful update, or it will turn red indicating a failure. A failure can happen when you didn't follow the instructions in the previous steps or your PC had a dropout during playback. If this failure happens, don't panic, but follow the next steps precisely:
    a. DO NOT POWER OFF the USB-XIII (doing so will render your Pinot inoperable).
    b. Disconnect your computer from the USB-XIII.
    c. Push the Reset button on the front panel.
    d. Re-connect the USB cable.
    f. Go to step 3.
7. If playback of the update file has finished and the front panel does not display any error message, but indicates normal operation then stop playback and disconnect the USB cable.
8. power off the USB-XIII.
9. power on the USB-XIII and proceed to normal operation.

Now that you made it all the way to here it is time to take a deep breath and enjoy the high-rez immersion: