# MPD-5
Music Playback D/A Converter

USER MANUAL

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 block any ventilation openings.
- Do not install near any heat sources such as radiators, heaters, or other apparatus (including pre-amplifiers and amplifiers) that produce heat.
- Do not install this apparatus in a confined space such as book cases or closed cabinets.
- Unplug this apparatus from the mains during lightning storms or when unused for long periods of time.

CAUTION

CAUTION
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.
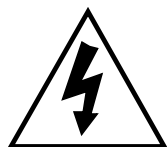
The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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.

INFORMATION TO THE USER

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

WARRANTY

Playback Designs warrants the MPD-5 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 MPD-3 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 for a RA (Return Authorization) number and 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.

If you purchased this product from a dealer please take a moment and send us an email to support@playbackdesigns.com so we can register you for the warranty. If this product has been shipped to you directly from Playback Designs you are automatically registered.

BEFORE USING THE PRODUCT

- What is in the box: MPD-5 playback system
                            Remote control unit with mounted batteries
                            USB-X extension interface
                            HD-15 and USB cable used with USB-X
                            Power cord (110V versions only)
                            User manual

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

- Installation: The AC voltage supplied to the unit should match the voltage rating
                            indicated on the rear panel.
                            Do not place the converter on the amplifier or any other equipment that
                            generates heat.

                            As the converter may become warm during operation, always leave
                            sufficient space around the converter for ventilation. Always allow
                            adequate air circulation around the player.
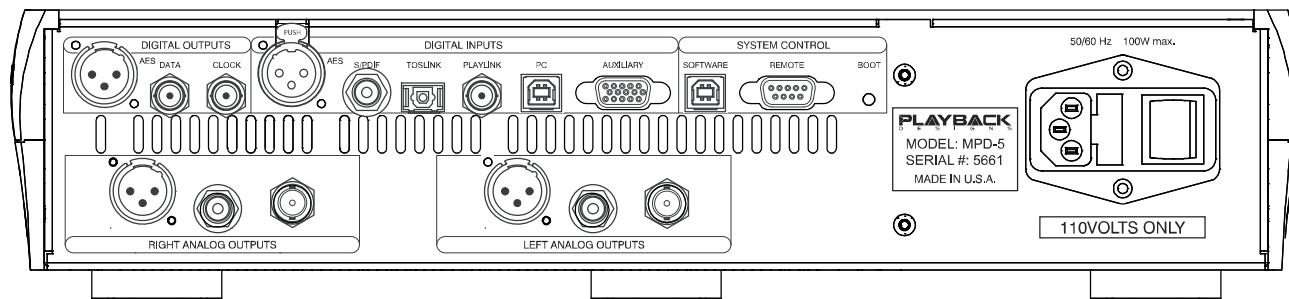
                            When moving the converter, make sure to turn off the power and
                            disconnect the power cord.

FRONT PANEL FUNCTIONS

Alphanumeric status display
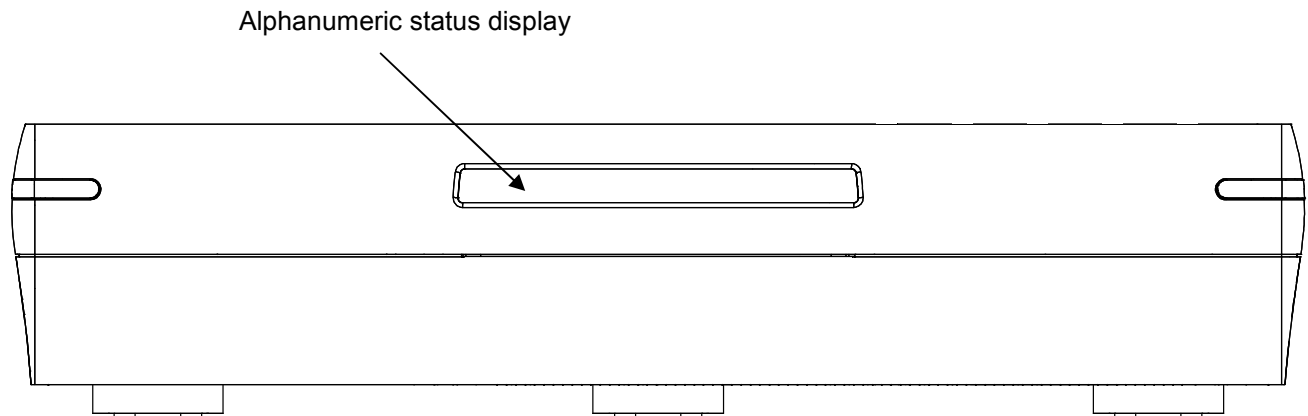
The front panel has no user buttons or switches, just an alphanumeric display. All functions of the MPD-5 are controlled via the IR remote or the serial RS-232 interface.

CONNECTIONS

Analog outputs: XLR: balanced, 4Vrms @ 1kHz full level, pin 2 Hot
RCA: unbalanced, 2Vrms @ 1kHz full level
BNC: unbalanced, 50Ω, 2Vrms @ 1kHz full level

Digital outputs: XLR: AES/EBU formatted for stereo linear PCM data.
DATA / CLOCK: Only the DATA output is used for the proprietary optical link (PlayLink) to other Playback Designs equipment, such as the MPS-5 integrated disc player.

Digital inputs: AES: XLR connector for AES/EBU formatted stereo linear PCM data, up to 24bits and up to 192kHz.
S/PDIF: same as AES, but S/PDIF formatted on RCA connector.
TOSLINK: same as S/PDIF, but on optical connector.
PLAYLINK: This optical proprietary link (PlayLink) is used to connect to other Playback Designs equipment, such as the MPS-5 integrated player or the USB-X interface. This connection supports multiple audio formats.
PC: Direct USB connection to Windows based computers for sample rates up to 48kHz. Before connecting to PC, make sure that PC input is selected on MPS-5 and the PC is turned on, so that the PC can enumerate the link. Subsequent changes of selected inputs on MPS-5 are then possible without disconnecting the USB cable. However, when powering down the PC the enumeration is lost and the link has to be set up again as described above.
AUXILIARY: Used to connect legacy USB-X interface.

System Control: SOFTWARE: This USB connection to a Windows based PC is used to update the software of the MPD-5 converter.
REMOTE: RS-232 wired remote control (see appendix for further details).
BOOT: Used in connection with software update procedure. When pressed during normal operation it resets the player.

Power: Before connecting the converter to the AC mains, please make sure that the rated voltage for the MPD-5 is set correctly as indicated on the rear panel. Operating the converter at the wrong voltage will damage the unit. The voltage rating of the power supply cannot be changed by the user.

REMOTE CONTROL UNIT

MUTE   Mutes the analog outputs, but not the digital ones.

Input Selections:
DISC   Not used on MPD-5.
AES   Selects the AES input for conversion to analog.
COAX   Selects the COAX input for conversion to analog.
TOS   Selects the TosLink input for conversion to analog.
PLINK   Selects the PlayLink input for connection to USB-X.
PC   Selects the USB input from PC.
AUX   Not used.

PHSE   The first time this buttons is pressed the alpha-numeric display indicates the absolute phase for the analog outputs. If it is pressed again within 5 seconds the absolute phase is toggled.

CLR   Press and hold this button to enter the setup menu and to display settings. See section "setup menu" later in this manual for more details.

All others   Not used on MPD-5.

CHANGING BATTERIES ON REMOTE
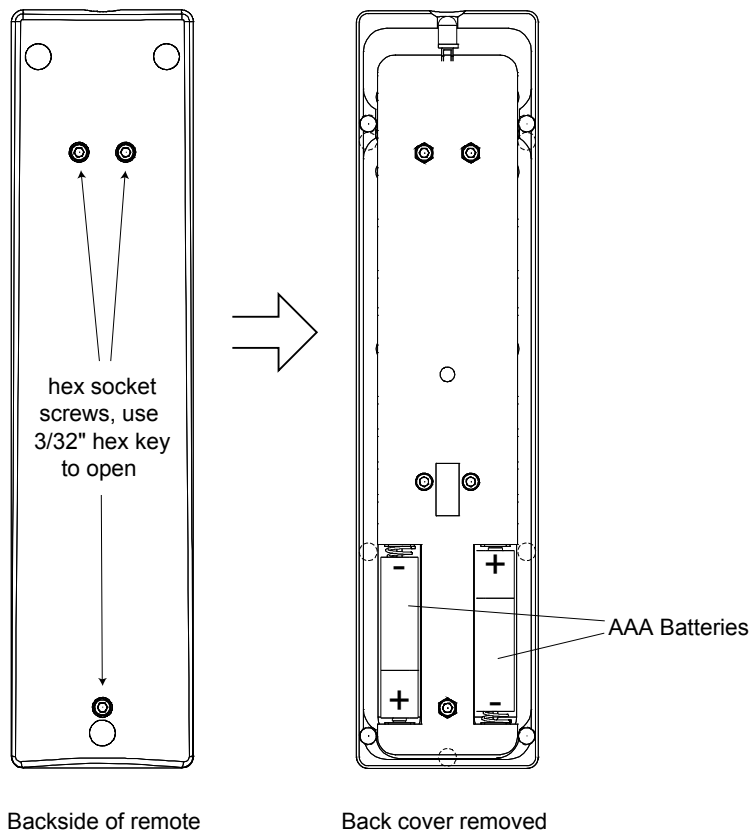
The remote operates with 2 AAA size batteries. In order to change them the back cover needs to be removed as shown in picture on the left. Make sure that replacement batteries are inserted with their polarities as indicated in the picture. The screws can be opened with a 3/32" hex or Allen key.

hex socket screws, use 3/32" hex key to open

AAA Batteries

Backside of remote   Back cover removed

CONNECTING THE MPD-5 TO A WINDOWS BASED PC or APPLE MAC

The MPD-5 provides 2 different ways for you to connect to a computer:
1. Via its internal USB connector on the back panel. This connection is limited to 16bits and 44.1 / 48kHz.
2. Via the USB-X interface. This connection supports PCM resolutions of up to 24/384kHz and DSD up to 5.6448MHz.

1. CONNECTING THE MPD-5 TO A PC VIA ITS INTERNAL USB INTERFACE
Again, the MPD-5 is equipped with an internal USB port that only supports PCM in 16bits and 44.1/48kHz. In order to guarantee the best sonic performance of the MPD-5 when playing from other sources connected to other inputs or from its internal transport the USB port is disabled. This makes it necessary that when a PC is booted the USB (PC) input is selected on the MPD-5 BEFORE connecting the USB cable from the PC. This allows the operating system on the PC to identify the MPD-5 and configure its audio port. Once the connection has been established and the PC is not turned off the input selection on the MPD-5 can be changed freely without the need to disconnect and reconnect the USB cable. However, when the PC is power cycled the enumeration is lost and the above described procedure is necessary to gain it back.

The following operating systems are supported without any additional driver installation: Microsoft Windows XP or later (English and Japanese editions), Apple Mac X 10.0 or later (English and Japanese editions).

PLAYBACK
D E S I G N S

2. CONNECTING THE MPD-5 TO A PC VIA THE USB-X INTERFACE

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) and 5.6448MHz.

Connection protocol and method: USB 2.0 / Audio class 2.0 compliant, asynchronous mode where MPD-5 generates high precision clock master and computer is clock slaved.

PC requirements: Windows 7 or later
ASIO compatible player software such as JRiver, Foobar, MediaMonkey etc.
Internet connection for downloading software from **www.playbackdesigns.com**.

Mac requirements: OS X (10.6.6 or later)
iTunes with or without plug-in to automate sample rate switching.
Internet connection for downloading software from **www.playbackdesigns.com**.

In order for your computer to communicate with the MPD-5 and to exchange audio data custom driver software needs to be installed before you can connect it to the MPD-5. If your computer is a Mac running OSX 10.6.6 or later you don't need any driver software as OSX already supports all PCM formats up to 384kHz sample rate. DSD file playback is supported via the DoP standard using PCM frames which is also supported by OSX without any additional driver. A driver has to be installed on all Windows based PCs for any kind of audio playback via the MPD-5.

IMPORTANT NOTE FOR PC USERS:
The Windows operating system is by design not a real-time system. It is designed to allow certain processes to take time away from real-time processes such as playing audio. This can result in audible dropouts, sometimes very short, but sometimes also quite long. Some PCs are pre-configured with drivers and processes by the manufacturer that cause such dropouts, and others are user-installed with additional software that do not allow flawless real-time playback of audio. Fortunately, there is a free utility software that allows you to test your PC for real-time capability:
1. Go to http://www.resplendence.com/latencymon and download the utility program LatencyMon. There is also a good description of the program and some more technical background on the same website.
2. Run LatencyMon, leave it running for 10-15 minutes and the software will tell you if you PC is suitable for playing audio without dropouts.
If you are considering purchasing a new PC, this utility program is small enough and doesn't require any installation which allows you to load it onto a flash stick and test it on the PC you are thinking about buying. Most computer stores will allow this test.

Preparing your MPD-5 for the connection with the USB-X interface
1. Before connecting the USB-X interface to anything check in the Setup Menu (explained elsewhere in this manual) that the option "PLINK INPUT" is set to USB-XII. You should never attempt any changes in the menu with the USB-X interface connected.

2. Connect the optical cables as outlined in the drawing below. For this you have to remove the protective caps on all cable ends as well as on the connectors on the rear panel of the MPD-5. If the optical cables provided with the MPD-5 are not long enough you can easily replace them with much longer ones. The specifications are ST DUPLEX to ST DUPLEX 62.5/125 multimode fiber optical cable. They are usually available in computer stores.

3. Turn on power on the MPD-5 and select PLINK input from your remote. Do not connect the USB cable from the computer yet, until the driver software for your computer is properly installed, if required.
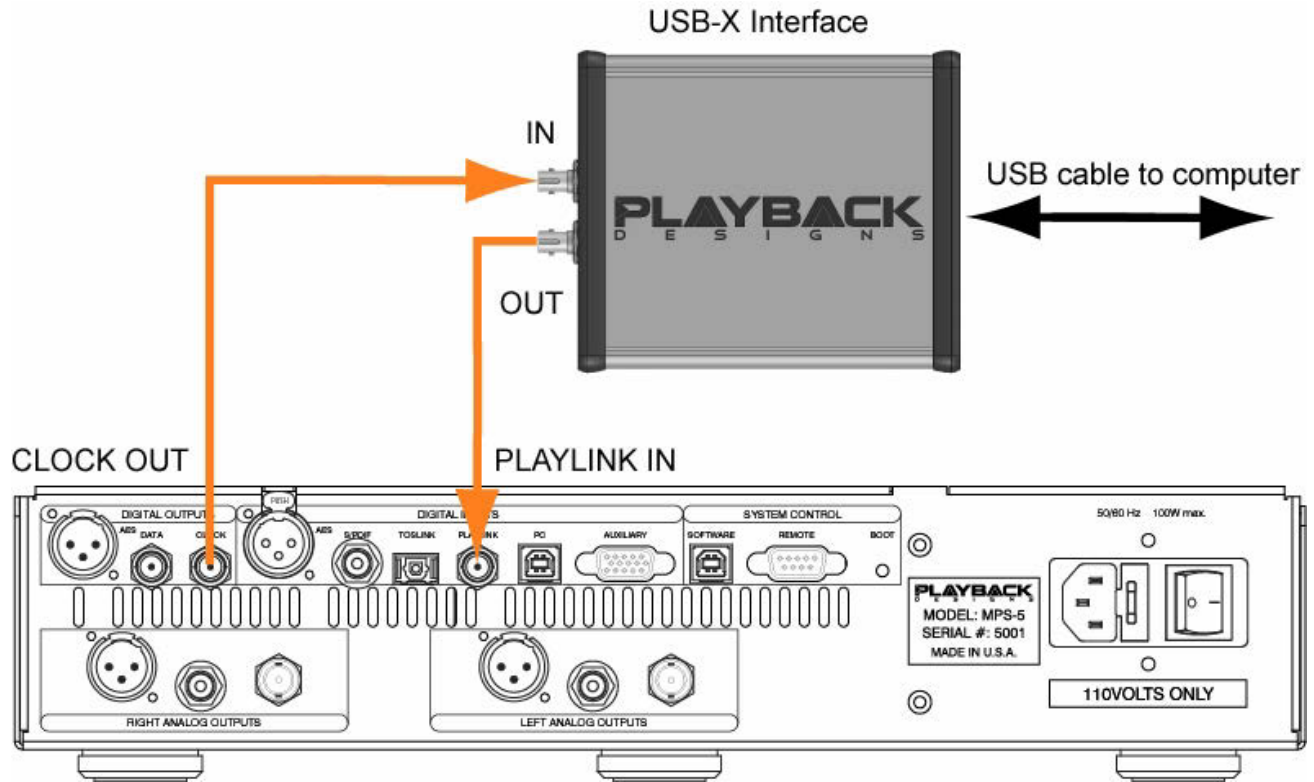
PLAYBACK
DESIGNS

Driver software installation and first time connection:

1. Turn on your computer.

2. Windows PC users only: Launch your favorite internet browser and navigate to **www.playbackdesigns.com**. Use "USBAudio" for password to enter the software download section. Download the latest driver:
   - akdesigndrv.zip for PC. Unzip it to the desktop.
   - No driver software is required for the Mac platform.

3. 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.

4. Once your computer is properly configured, power on the MPD-5, make sure the optical cables are connected as explained in the previous paragraph and connect the USB cable that was included with the MPD-5 between USB-X and your computer. Since the USB-X interface is powered by your computer, but receives the clock signal from the MPD-5 you must always power the MPD-5 first before connecting the USB cable. As soon as the MPD-5 is powered off the USB connection looses its clock and you will have to unplug and re-plug the USB cable from your computer

5. Select PLINK input from the remote control if not already done before.

6. The computer will take a moment to enumerate the MPD-5 on its USB bus and notify you when it is installed successfully. Do not attempt to play 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, 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, where the USB-X should be listed as an audio output device.

7. For PC users only: Configure your player software to send audio data to the ASIO interface. Depending on your player software this may be identified as "AKDesign USB ASIO" or simply as "ASIO". Some players may need a plug-in for ASIO compatible playback.

8. For Mac users only: launch iTunes.

9. For best performance and bit perfect reproduction make sure to set all volume controls in the computer playback 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 playback software or Windows / OSX. Control the volume only with your analog pre-amp.

10. Your system is now ready for high resolution playback.

Re-connection after system has been previously configured:
1. Before powering on the MPD-5 connect the USB-X interface as outlined with the drawing on the previous page.

2. Power on both computer and MPD-5. Select PLINK input on MPD-5.

3. Connect USB cable.

4. Enumeration should be quick on Windows and about 10 seconds with Mac and may not indicate anything except with failure. You may hear the relays clicking inside the MPD-5 as the computer sets the sample rate.
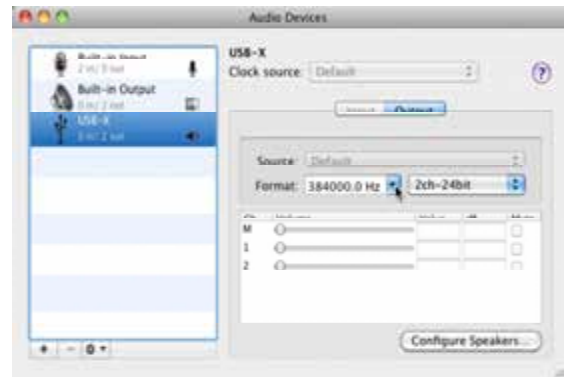
5. For best performance and bit perfect reproduction make sure to set all volume controls in the computer playback software, Windows / OSX control panel to exactly 0db (wide open), turn off all operating systems sounds, effects or equalizer that might be running in your playback software or Windows / OSX. Control the volume only with your analog pre-amp.

6. Your system is now ready for high resolution playback.

During playback with PC
When changing songs from within your computer player software the USB protocol automatically communicates all necessary sample rate changes to the MPD-5. The front panel of the MPD-5 always indicates the true sample rate during file playback. This system will never perform any sample rate conversion or any signal processing that could adversely affect the sonic performance, but rather use the exact bits from your file and convert them directly to analog.

During playback with Mac
The native OSX operating system and iTunes do not understand the needs of audiophile consumers and insist on sample rate conversion. When connecting the MPD-5 OSX will automatically select the highest possible sample rate (384kHz) and convert all your songs to this rate before playing them out through USB. This will result in degraded performance. You can manually select the sample rate in the Audio/MIDI Setup utility to correspond with the native sample rate of the song (as shown in picture), but this can be a tedious process if your library contains songs with more than 1 sample rate. Alternatively, 3rd party plug-ins for iTunes exist that automate this process and always select the correct sample rate for bit perfect playback. Check our website **www.playbackdesigns.com** for an updated list of supported plug-ins.

Playback of DSD files
The driver software and MPD-5 hardware are designed to support playback of DSD files at 2 sample rates: the standard 2.8224MHz as used on all SA-CDs and the double rate 5.6448MHz as supported by some professional recording equipment. You will need a playback software running on your computer that can read DSD files and play them to the USB driver. On the Mac platform you will have to use a playback software or iTunes plug-in that supports the DoP standard for playing DSD files. Check our website **www.playbackdesigns.com** for an updated list of playback software available.

Testing your system for bit perfect reproduction
Windows / OSX and your player software offer multiple places for volume control, effects processing, dithering, equalization or sample rate conversion. Generally, these algorithms affect the sonic performance in a negative way, especially in low volume listening levels. It is therefore recommended that all volume controls on your computer are set to exactly 0db (wide open) and all operating system souns, effects, equalizers and other algorithms are turned off. You should only control volume with your analog pre-amp. In order to test your system to make sure that no hidden control or algorithm on your computer may impact your sonic performance you can play a special test file:

1. Launch your favorite internet browser and navigate to **www.playbackdesigns.com**. Use "USBAudio" as password to enter the software download section. Download the test file "TestPat352.wav".

2. The test file contains non audible audio, but it is still a good idea to mute your preamplifier.

3. Launch your playback software and play the test file while the MPD-5 is connected via USB and its PLINK input is selected.

4. If all the controls on your computer are set correctly then the front panel on the MPD-5 will indicate this by displaying "BIT PERF" for 5 seconds at the end of the playback. If it doesn't show this then at least 1 control on your computer is impacting the performance of your system.

PLAYBACK
DESIGNS

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

2. While the MPD-5 has no problem supporting playback via USB while it is switched to a different input (i.e. disc playback, AES or Coax input) it is a good idea to stop playback on your computer before selecting another input. The clock management in the MPD-5 may not provide the correct frequency to the USB port if it is not selected. The computer software may have a problem with that and may malfunction. So when not listening to the USB input, stop playback on your computer.

When things do not seem to work
The MPD-5 is a hardware device with very little software inside and if it doesn't show any signs of malfunctioning in other playback modes, it is relatively safe to assume that the problem is either with the USB link or the computer. Generally, you should look for any signs of trouble on your computer first, and don't assume that because your computer may work with someone else's USB DAC, but not with the MPD-5, that the problem is with the MPD-5. The MPD-5 uses different software inside your computer.
Here are a few suggestions for what to do:

1. The USB-X interface is powered by the computer via the USB cable, but the clock signal is coming from the MPS-5. So every time you turn off the MPS-5 you will have to unplug the USB cable from the computer and plug it back in once the MPS-5 is powered up again.

2. Make sure that the driver is properly installed (PC only). See step 6 under driver installation above for instructions for how to check successful installation and connection.

3. Make sure the USB-X is properly connected to the MPD-5 with the included optical cable. Only use the cable that was shipped with the USB-X. If the front panel indicates "NO LOCK" when the PLINK input is selected then that points to a broken connection with the USB-X.

4. Make sure you use the USB cable that was shipped with the MPD-5. Other USB cables can be used, but they need to be USB2.0 compatible.

5. Disconnect the USB cable and restart your computer.

6. Connect the USB cable while the PLINK input is selected on the MPD-5. On Mac computers it can take up to 10 seconds to enumerate.

7. On Mac computers it can happen that after successful enumeration OSX selects the internal audio output instead of the MPD-5. This can easily be corrected manually in the sound control panel in System Preferences as shown in this screen shot.

8. If at this point your PC computer still does not play through the MPS-5 and the driver or USB-X cannot be identified in the Device Manager (PC) then disconnect the USB cable and try re-installing the driver following exactly above instructions.

9. If you are a PC user and are able to play audio, but you hear occasional dropouts, please see IMPORTANT NOTE FOR PC USERS above. You should definitely run LatencyMon.
.

PLAYBACK
DESIGNS
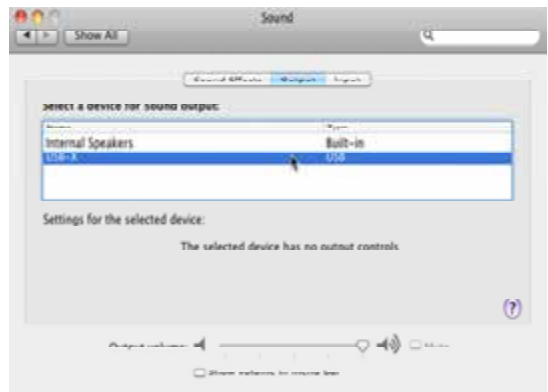
SETUP MENU

The MPD-5 has several user programmable options that can be set via remote control. By pressing and holding the CLR button the setup menu is displayed on the front panel. After no further button has been pressed for 5 seconds the display goes automatically back to normal operation. After entering the setup menu the CLR button can be pressed shortly to advance to the next menu item. Each programmable menu item may be toggled between 2 settings by pressing the play button.

IMPORTANT: Do not attempt to change any settings while the MPS-5 is connected to any PLINK or USB-X devices. Always disconnect any optical cables.
The following options are available in sequence:

1. Serial number. This option is not user programmable.

2. Firmware version. This option is not user programmable.

3. Center Mix: Used for multi channel playback and only programmable for the MPS-5.

4. Optical Output Format: the optical data output supports PLINK or SONOMA formats. PLINK is a proprietary format used to link to other Playback Designs products for multi channel or multi room setups. SONOMA is used to connect to professional recording equipment. This function is only programmable for the MPS-5.

5. Optical All Channels: when using PLINK output format set this off for multi channel configuration or on for multi room configuration. In multi channel configuration only those channels are sent out via PLINK that are necessary for the next following DAC in the chain. In multi room configuration all channels are sent out via PLINK output, so that the same audio program can be heard in multiple rooms. This function is only programmable for the MPS-5.

6. PLINK Input format: The MPD-5 needs to know if the device you are connecting to its PLINK input is the optical USB-X interface (USB-XII) or any other device that supports the PLINK format.

7. IR Locked / Unlocked: this option is only programmable for the MPD-5 and allows disabling all remote control commands when the MPD-5 is part of a multi channel setup.

PLAYBACK
DESIGNS

EXTERNAL CLOCK

A unique feature of the MPD-5 is its elaborate and sophisticated clock generator which does not require to be locked to an external source. It completely shields any incoming digital audio stream from its sensitive internal clock circuitry through various stages of buffering with unique control algorithms. This removes any incoming jitter from external sources so well that no complicated setups with master – slave clocking configurations are needed, as is often the case with other equipment. In fact, the MP-5 performs equally well with jittery sources as with higher quality ones. For this reason the MPD-5 does not require an external clock nor does it require to be set up as a clock master.

BREAKING IN THE MPD-5

Breaking in the Playback Designs MPD-5 is time consuming but well worth the effort. It would be a mistake to pre-judge the converter based on what you might hear at first listen. This is what you can expect to hear at different intervals during break-in:

1. Out of the box: The converter will have good clarity, but the highs can be recessed. Bass might appear to be a bit muddy and lacking punch. Soundstage might sound closed in.

2. 50 - 150 Hours: The sound will open up a little bit, but can still sound a bit brittle.

3. 150 - 350 Hours: Midrange will start smoothing out and clarity will increase, but highs might continue to remain recessed. At this point, there probably will not be much change in the bass. You will probably wonder how the Playback Designs converter will ever sound like others have described, but we assure you that you will start to hear substantial changes within another week of play.

4. 350 - 500 Hours: The magic will be starting. Highs will be open and airy. Midrange will appear much more full bodied and natural. Soundstage will be huge and the image presentation will start appearing very holographic. Bass will be incredibly deep and tight with texture and detail galore.

5. Over 500 Hours: The player will continue to change subtly over the upcoming month of usage, but you should be recognizing a very life-like and natural sound.

SPECIFICATIONS

Power Supply
      North America model………AC 120V, 60Hz
      Europe model………………AC 230V, 50Hz

      Consumption…………………………...100W

Weight…………………………………….. 11kg / 24 lb

Ext. dimensions (W x H x D)   43.5 x 9.8 x 42.3cm
                  17.1 x 3.5 x 16.7 inches

Batteries for remote control unit………………2x AAA

Analog Audio Outputs:
    XLR: 4Vrms @ 1kHz full level, pin 2 Hot
    RCA: 2Vrms @ 1kHz full level
    BNC: 50Ω, 2Vrms @ 1kHz full level

Operating Temperature………………+5°C to +30°C

Operating Humidity……………………… 5% to 85%

Mains fuse: 1.6A / 250V slow blow, 20mm

CHANGING THE FUSE ON THE MPD-5

Inside the power connector on the rear panel of the MPD-5 is a fuse that protects the converter from dangerous power surges. If the converter fails to power up or no light on the front panel is lit then proceed as follows to change the fuse:

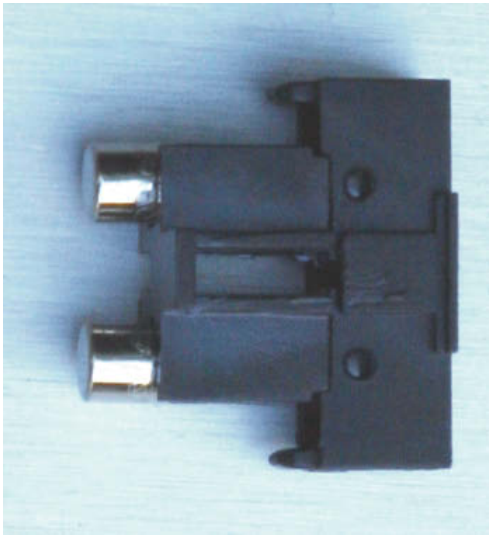1. Locate fuse compartment on power connector on rear panel.

2. Use a small screw driver to pry open the fuse holder.

Fuse Compartment

Prying open with a small screw driver

3. The fuse holder contains 2 fuses. The top one is a spare and can replace the blown one at the bottom.

4. Replace fuse holder into power connector by making sure that good fuse is at bottom. Replacement fuses should be rated: 1.6A / 250V slow blow, 20mm.
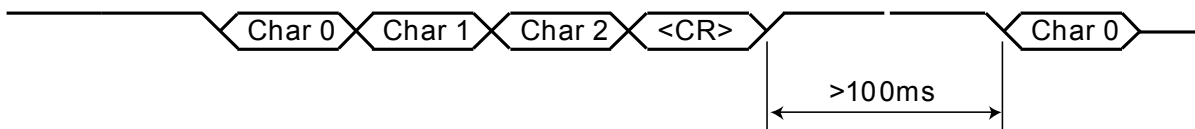
PLAYBACK
DESIGNS

Appendix A: Serial Remote Control (RS-232)

The MPD-5 can be remote controlled via a 9-pin RS-232 link. When connecting to a PC the required cable should be non-crossed and the link parameters should be set to:

- 19,200 baud
- 8 bits
- 1 stop bit
- no flow control
- no parity bit

**Commands to the MPD-5:**

All commands sent to the MPD-5 consist of 3 ASCII characters followed by a <CR>. Repeating a <CR> will repeat the last command sent. Received commands are not stored in a stack and, therefore, need to be sent in intervals of at least 100ms to allow enough time for the MPD-5 to execute a command before receiving the next one.

phs	Toggles phase inversion on and off
mte	Toggles mute on analog output on and off
don	Turns front panel display on
dof	Turns front panel display off (unit keeps operating)
aes	Selects AES input for playback
rca	Selects Coax S/PDIF input for playback
tos	Selects optical TosLink input for playback
plk	Selects optical PlayLink for playback (AES formatted)
usb	Selects USB (PC) input for playback
aux	Selects Aux input for playback

Status info from MPD-5

The MPD-5 continuously sends back 7 Bytes terminated with a unique Sync Byte (xFF).
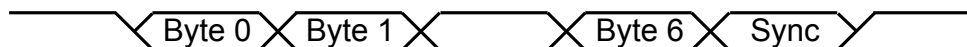
Byte 0		Reserved
Byte 1		Reserved
Byte2		Reserved
Byte 3		Reserved
Byte 4		Reserved
Byte 5		Reserved

PLAYBACK
DESIGNS

| Byte 6	bit 2-0	0: unefined
		1: AES input selected
		2: RCA input selected
		3: TosLink input selected
		4: PlayLink input selected
		5: USB (PC) input selected
		6: Aux input selected
	bit 6-3	1: 44.1kHz detected on digital input
		2: 48kHz detected on digital input
		3: 88.2kHz detected on digital input
		4: 96kHz detected on digital input
		5: 176.4kHz detected on digital input
		6: 192kHz detected on digital input
		7: 352.8kHz detected on digital input
		8: 384kHz detected on digital input
		9: DSD detected on digital input
		10: DSD 2X detected on digital input
		15: no lock
	bit 7	1 when audio phase inverted on analog outputs
Byte 7		Sync Byte (xFF)

PLAYBACK
DESIGNS

Appendix B: Upgrading the Software in your MPD-5

Playback Designs is constantly innovating new algorithms and methods for audio processing and from time to time may release new software for the MPD-5 that may further enhance the sonic performance or add new features. As new releases become available you will be able to download it to the MPD-5 from a PC via a dedicated USB connection on the back of the unit. It will be distributed along with a software application running on the PC that will guide you through the programming steps

First Time Installation and Upgrade Procedure:

1. Do not connect the MPD-5 yet to the PC.
2. Launch the supplied application "PDSetup.exe" on your PC and closely follow instructions on the screen. Connect your MPD-5 to the PC only when told so. But before then hitting the NEXT button, wait until Windows confirms that the driver is fully installed and operational. Only then hit NEXT.
3. When you reach the following screen, make sure to point the field "File to Transfer" to the file supplied by Playback Designs (use the Browse button to find the location of the file).
4. Hit Update and programming will start automatically. Be patient, because it can take several minutes to complete as the erase cycle and the file are quite long.
5. When completed, turn off power to the MPD-5 (switch on back panel), wait 15 seconds and power it back on again. DO NOT POWER OFF BEFORE PROGRAMMING IS COMPLETE (which can take several minutes).
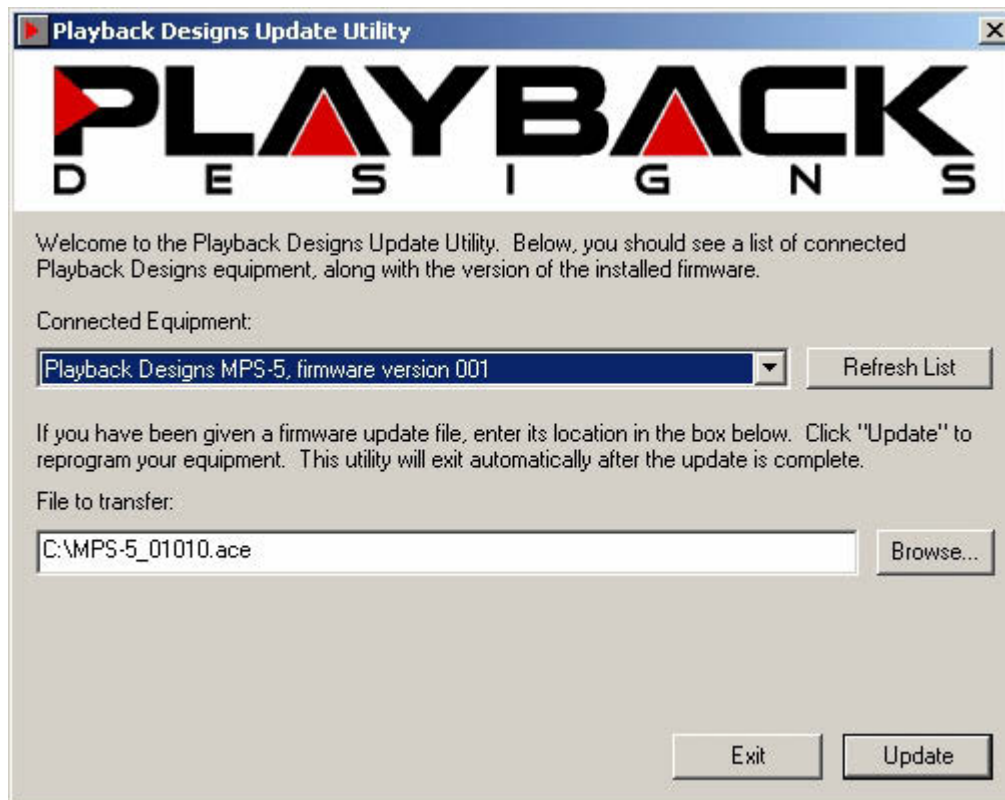
Subsequent Upgrade Procedure:

After you have used the PDSetup utility for the first time a shortcut PDUpdate is installed on the desktop of your PC as well as in the START>PROGRAMS>Playback Designs folder. There is no need to launch the "PDSetup.exe" application anymore.

1. Turn on power to the MPD-5.
2. Connect your MPD-5 to the PC via a USB cable.
3. Launch PDUpdate from the desktop of your PC and you should see the above screen directly.
4. Proceed from here as for the first time installation.

IMPORTANT NOTE:

THE ENTIRE UPDATE PROCEDURE CAN TAKE SEVERAL MINUTES. IT IS IMPORTANT THAT YOU DO NOT INTERRUPT POWER TO THE MPD-5, NOR DISCONNECT THE USB CABLE, NOR TURN OFF THE PC DURING PROGRAMMING, OR ELSE YOUR MPD-5 WILL NOT BE ABLE TO BOOT NORMALLY.

In case the programming has been interrupted accidentally, please follow the steps below:

1. Turn off power to the MPD-5 via its back panel switch.
2. Press and hold the Boot button on the back panel.
3. Turn power back on. Release the Boot button.
4. Proceed as described under "Subsequent Upgrade Procedure".