come. see. listen.

PSD192 / PSD192M

Digital Phono Pre-Amplifier
with Digital Synchronus Motor Supply

true digital audio

List of Contense:

Facts about ***behold***

behold has been created for those who believe that music is the epidimy of culture, which must be experienced and preserved and without deference to cost. Other high-end stereo systems provide very good dynamic range and sound quality. However for near perfect symphonic reproduction a new class of products was born.

behold is the implementation of a brand new design philosophy based on an exciting breakthrough in technology. This stereophonic jewel was created for the sole purpose of reproducing music at home identically to that of the original event. Its components are built individually in Germany with the precision and care most often found in state-of-the-art space exploration equipment. The quality and longevity of the **behold** system is beyond compare and will deliver a blend of art and science for the truly discerning connoisseur beyond all possible expectations.

behold is capable extracting every nuance, every note, every shade or shift of tone from the target storage media to the speaker. Great care has been taken to maximize the various sources of music from Vinyl, to CD, from SACD to DVD. Each individual component has been created by merging advanced electronic, industrial, and mechanical designs into near perfection. The system quite simply, is something to "**behold"**.

Ralf Ballmann
President

Who is ***behold***

The brand behold has been created by Ballmann Electronics. This firm has a rich, 20 year heritage in, among other things, high end test equipment including the world's most complex 6GHz network analyzers. The company's move into audio is deliberate and justified and brings a whole new level of understanding to the audio industry. High frequency analyzers are considered to be the most complex and most challenging measurement systems to build. They require the engineering equivalent of a brain surgeon in the areas of signal sensitivity and accuracy. It is this leadership that Ballmann Electronics breaks to bear for the pure pleasure of audiophiles everywhere.

All **behold** components have a distinctive and unique user interface, specifically designed for ease-of-use. The state-of-the-art software may be updated for free through the internet for as long as you own your equipment. Even the remote control is fully programmable and its connectivity is based on Bluetooth Technology, more commonly found in high technology cell phones, rather than simple infrared. The technological skill and innovation in Ballmann Electronics spans from audio to radio frequencies (RF), from software programming to digital signal processing (DSP) and ensures that **behold** components have been developed as a unified system, maximizing performance at every step. Whereas most programming today is done in languages such as C++ and visual basic for speed, these components have been programmed in assembler, a far more complex and difficult language but one that maximizing performance and minimizes overhead. This is one of the ways that the behold system is able to maintain full signal integrity and handle enormous amounts of audio data without resorting to under-sampling, a common practice even in high end stereo equipment. For superior audio equipment- **behold**.

In General

One will be thrilled with the multitude of functions and by the concept of simple and intuitive operation.

The PSD192 is controlled by three buttons on the front panel, and offers playback of vinyl records at first-class quality. The latest technology is used to give this high performance.

Equipped with a standard USB-output, the PSD192 can be connected to all PC- and MAC-based computers. The configuration and firmware-updates are possible using the Windows XP/2000 operating systems. However, audio recordings are possible with all operating systems that support USB-audio-device functionality.

If some equalizer function should be defined, a firmware-update performed or to operate the parameters of the PSD192 from a PC, the installation of the Windows software “behold myPSD192” is needed.

Something special you can get: as an option a turntable motor supply built-in the PSD192M is available to operate a synchronous motor very precise with quartz controlled accuracy and stability.

The Phono Stage PSD192 & PSD192M is developed and manufactured in Germany.

Software updates are available free of charge on our website:
http://www.behold-highend.de/page.php?en620000

Buttons and Connections

Front side

Centre Button
Motor ON,
next speed,
Motor OFF

Left LED (Indicator)
Actual speed,
overload,
operating mode

Right LED (Indicator)
Actual speed,
overload,
operating mode

Left Button
Exchange polarity,
gain 0.5dB steps decreasing,
speed -0.1% steps decreasing

Right Button
Exchange equalisation,
gain 0.5dB steps increasing,
speed -0.1% steps increasing

Rear side

Motor (PSD192M only)
9 pole socket to supply a synchronous motor

Digital Output
Cinch socket for electrical digital output

USB
USB connection for configuration and audio recording

Phono Input Left
Cinch socket for the left channel input

Phono Input Right
Cinch socket for the right channel input

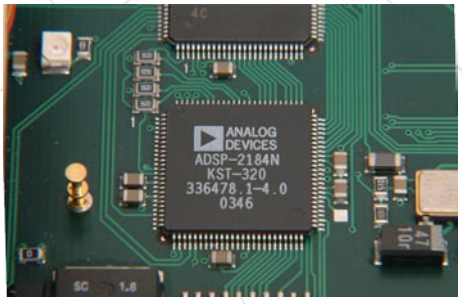
Analog Output Left
Cinch socket for the left analogue output

Analog Output Right
Cinch socket for the right analogue output

Digital Output
Toslink socket for optical digital output

Mains
Mains plug

Inside



General Features

The PSD192 is in comparison small and compact, but possesses a multiple functionality and specifications that we will summarized here:

➤ Unusual good resolution of musical details

The PSD192 comprises of the latest technology to reveal the smallest details of the record. This is possible because these details are neither hidden in, nor overcast with additional noise. Such quality can only be achieved by using high grade components in an innovative new electronic circuit design. No capacitors are used in the signal path, nor other negative circuit designs like this.
Digital signal processors are used to equalize the input signal. This enables a very high quality performance and also user definable equalizer functions. In addition one gets an at any time reproducible sound.

➤ Analogue and digital outputs and USB-Recording

The PSD192 is equipped with analogue and digital outputs, so whatever is needed the audio signal for further processing at the pre-amplifier is available. Analogue signals are supplied through a low impedance output at standard level (2.4Vrms), digital signals are available in several ways. The S/PDIF audio signal is available at three different sampling rates, 48/96/192kHz. The electrical runs from a Cinch 75Ω and the optical from Toslink. Recordings using a standard USB-interface are performed with a sampling rate of 48kHz in 16Bit Stereo.

➤ Processor controlled supply drives synchronous turntable motors

The design with digital pulse width processors enables highest precision for controlling two-phase synchronous motors. RPM values are done at quartz precision and can be varied with a very fine resolution of 0.1% intervals.

➤ Suitable for all synchronous motors from 6V up to 24V

The design with digital pulse width processors enables us to supply a variety of motors. The output voltage can be set at levels from 6.0V up to 24.0V in steps of 0.1V.

➤ Front panel buttons operation or with PC-Software

The day to day operation of the PSD192 is done with three buttons on the front. All the configurations can comfortably be done with a PC and the Windows baised software “myPSD192”.

➤ Ultra low noise crystal oscillator for lowest jitter values

The extreme low noise crystal oscillator enables high accuracy for sampling the audio signals. This applies for the A/D-Conversion of the analogue signal as well as getting back the analogue signal by the D/A-Conversion.

➤ Switch mode power supply for phono preamp and motor supply section

The PSD192 has a built in switch mode power supply feeding both, the phono-preamp and the motor section. A very low power consumption and a high range of mains voltage from 100V up to 240V results. An external power conditioner is no longer needed using this circuit design concept.

➤ Rugged aluminium housing

The housing of the PSD192 is made from 2.5mm thick aluminium and has a massive 8mm front panel, clearly underlining the high value of this product.

➤ CE-Certification
EN 55013: 2000, EN 61000-3-2: 2000, EN 61000-3-3: 1996, EN 55020: 2000 and EN 61000-6-1: 2001

Today, a legal obligation, but not so common, the CE-Certification! We have spared no effort nor cost to fulfil these requirements, and have also certification by independent testing agency.

Features of the Phono- and Digital Audio Section

➤ Ultra low noise unbalanced input stages

The analogue input stages of the PSD192 are built around the well known lowest noise audio-operational-amplifiers, the AD797. This allows for a highly flexible circuit design, needs no capacitors in the signal path, and is also extremely low noise in operation. With this gained flexibility both MC and MM systems can be used. In addition different gain settings of 0dB, +6dB, +12dB, +18dB up to +24dB can be obtained.

➤ Direct 24Bit/192kHz A/D-Conversion after pre-amplification

Immediately after the pre-amplifiers the A/D-Conversion of the non equalized phono-signals is performed, at a very high sampling rate of 24Bit/192kHz. No analogue equalization is done, which would have the same disadvantages as normal analogue phono equalizers. There is no use of signal coupling capacitors, and the A/D-Converter is DC-coupled also.

➤ Digital Phono equalizer at 192kHz sampling rate

The digital phono equalizer is realised with the help of a DSP working at the full sampling rate of 192kHz. This serves the best quality at a sampling rate that is also found with SACD and DVD-Audio.

➤ Variable digital attenuation / gain

At the same time the DSP supplys a fine tuning of the
phono-amplification. The wide range enables an gain from
-10dB up to +12dB in steps of 0.1dB. The value can be set and stored by using the front panel buttons or with PC-control.

➤ Eight predefined equaliser functions recalled by button or by USB control

The PSD192 contains the eight most used equalisation funtions, recalled by pressing a button on the front panel, or more comfortably using the myPSD192 software. The eight stored lines are:

RIAA, RIAA (IEC), TELDEC, AES, Columbia LP M33, NAB, NARTB und London M33&M45.

➤ User defined equalizers can be designed, stored and recalled

In those rare cases, that a playback of a record with an equalisation function not found in the PSD192, one can design an equalizer function. This can be done entering the required time constant parameters or by modifying an existing function. The result can be stored and recalled under a userdefined name.

➤ 24Bit D/A-Converters at 192kHz sampling rate for high quality analogue output

The analogue outputs are supplied from a D/A-converter at 192kHz sampling rate using 24Bits Stereo. The output offers a low impedance, high level signal (2.4Vrms) to the unbalanced cinch sockets.

Features of the Motor Supply Section

➤ Real DSP based Direct Digital Synthesizer (DDS) for flexible motor supply

A direct digital synthesizer is a digital oscillator that offers a sinus function with mathematical precision. With regard to that fact it's the most precise oscillator known today. Using a DDS makes it possible to generate a sinus signal at any frequency needed to supply a synchronous motor in the best possible way.

➤ Two phase synchronous motor supply with absolute exact 90°-phase shift

Also the DDS can deliver an exact 90° phase shifted signal, by calculating not only the sinus, but at the same time the cosine function. Both signals are supplied with the PSD192M on the motor supply section.

- **Crystal stabilised audio time base also for the DDS-System for the motor supply**

Because the DDS works through the DSP with the same base frequency, thus his frequency is automatically crystal stabilised. At the same time this circuitry prevents any flutter from that point of view.

- **Maximum torque from synchronous motor that starts through frequency- and voltage control**

Every synchronous motor delivers its maximum torque when his RPM is synchronous to the frequency of its supply voltage. So it is useful for the motor to control its startup at low frequency, and than increase this frequency gradually until the required RPM is reached.

- **Motor supply in switched mode with efficiency over 95% avoids use of a heat sink**

The PSD192M has a motor driver with switched mode power supply. Because of this and the resulting high efficiency of more than 95% no extra cooling is required. This save energy and prevents heating up. At the same time this technology enables the motor supply to operate at different voltages. When the voltage is low, a higher current is supplied automatically.

- **Front panel buttons or USB enable fine tuning of RPM speeds in steps of 0.1%**

The employment of a DDS-System offers the possibility for a very fine tuning RPM of the turntable. With the PSD192M steps as small as 0.1% are available. The adjustment ac be done through the front panel buttons, or on the PC using the USB connection and the myPSD192 configuration software.

- **Large control range of +/-50% of nominal RPM setting**

With the DDS-System many frequencies can be set, so a very wide range of RPMs is resulting.

- **Three different speeds: 33/45/78 RPM**

The PSD192M can work on all 3 speeds of turntables. Thed speed selection can be done by the buttons or by using the configuration software myPSD192. All speed related settings are user definable and can be set and stored individually. Also an „absolute“ and „relative“ speed setting is available by the configuration software myPSD192.

- **Output voltages from 6V up to 24V using two bridged supplies**

The two full bridge supplies at the PSD192M motor supply are able to deliver motor voltages from- 6.0Vrms up to 24.0Vrms. The DDS digital control allows a step resolution of 0.1Vrms.

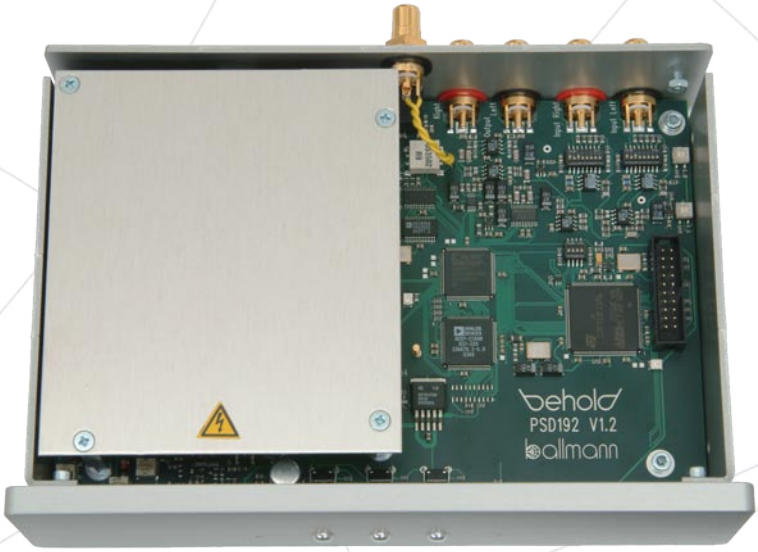
- **15W maximum output power**

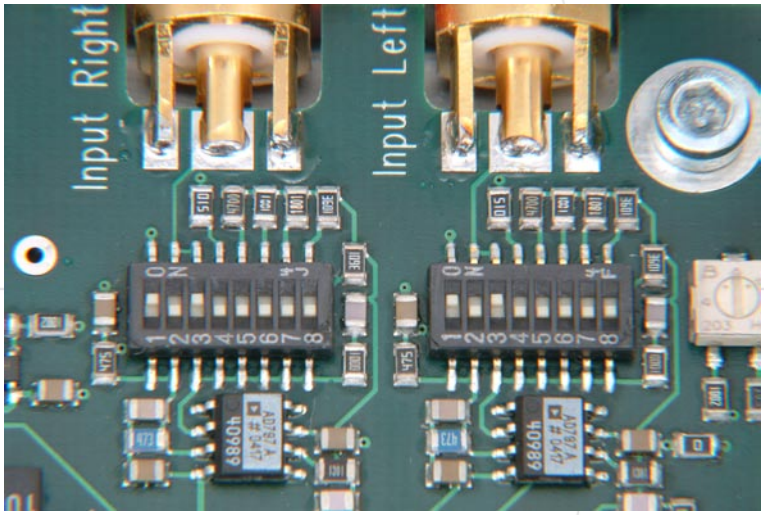
15 Watt is an output power suitable for most turntable motors, independent of the value of the voltage. Also more than one motor can be driven in parallel as long as the 15 Watt power consumption is not exceeded.

- **Electronic overload and short circuit protection**

Of course the PSD192M motor supply outputs are short circuit protected against each other or to ground. A continuous overload situation is prevented as the digital electronic circuit switches off in such a case.

Settings for Cartridges





Using the four left switches (1-4) the type of cartridge is set, either Moving Coil (MC) or Moving Magnet (MM). The four right switches (5-8) enable the gain setting.

➤ **Settings for MC-cartridges**

MC Output Voltage in mV	Gain in dB	S1	S2	S3	S4	S5	S6	S7	S8
0.63	71.5	ON	off	ON	off	off	off	off	off
1.25	65.5	ON	off	ON	off	off	off	off	ON
2.0	59.5	ON	off	ON	off	off	off	ON	off
5.0	53.5	ON	off	ON	off	off	ON	off	off
10	47.5	ON	off	ON	off	ON	off	off	off

➤ **Settings for MM-cartridges**

MM Output Voltage in mV	Gain in dB	S1	S2	S3	S4	S5	S6	S7	S8
3.1	57	off	ON	off	ON	off	off	off	off
6.3	51	off	ON	off	ON	off	off	off	ON
12.5	45	off	ON	off	ON	off	off	ON	off
25.0	39	off	ON	off	ON	off	ON	off	off
50.0	33	off	ON	off	ON	On	off	off	off

Functions of the Front Buttons

The PSD192 is equipped with three buttons on the front panel. Using these all functions can be controlled and most of the parameters can be set. The designation and function of the buttons is dependant of the current operational status of the PSD192.

Standard Operational Status

This modus of day to day operation is entered by connecting the PSD192 to mains. In this mode the buttons have following function when pushed shortly (shorter than 1 second):

- **Left button:** inverses the polarity of the audio signals.

- **Center button:** push to chose between 33 (left LED), 45 (right LED) or 78 (both LEDs lit) RPM speed selection. When this button is pressed longer than 0.5 seconds, the supply of the turntable motor is switched off. Pushing again ramps up the motor to the last selected speed. As long as the LEDs are flashing the platter has not reached the desired constant speed (also read the section “Ramp Up Speed” of the configuration software myPSD192 on page 21).

- **Right button:** switching to the next stored equalizer function. The right LED will indicate the current place by the number of flashes . The number of flashes equals the place of the selected equalization function. (max. 8 stored equalization function possible).

Calibration and Adjustment

This operational mode is selected by pushing the left or right button for more than one second.

- **Left button:** amplification/attenuation

The PSD192 has the possibility to add an extra digital amplification of up to +12dB. Attenuation also can be performed (up to -10dB).

This adjustment can be very useful when making direct comparisons between vinly records and CDs. Since a real objective comparision is only possible when both levels of the sources are set to exactly the same volume.

Selecting an attenuation is also possible here. This can be useful for instance when a pre-amplifier has an analogue input with a sensitivity of less than 2.4Vrms.

- **Right button:** motor speed setting (PSD192M only)

The PSD192M stores two values for every speed. An „absolut“ and a „relative” correction value can be stored. The absolute value (calibrational setting) can only be done by using the configuration software myPSD192. On top of this absolute value the operator may set a relative offset using the front panel buttons. It becomes very easy now to play a vinly record more slowly or faster and return back to the calibrated values afterwards. In case this functionality is not needed, the correction of the speeds using the front panel buttons will do.

Digital Recording

To make digital audio recordings from vinyl records on a PC, MAC or onto DAT tapes, one have to make a selection between the S/PDIF (optical or electrical) output or the USB-Output.

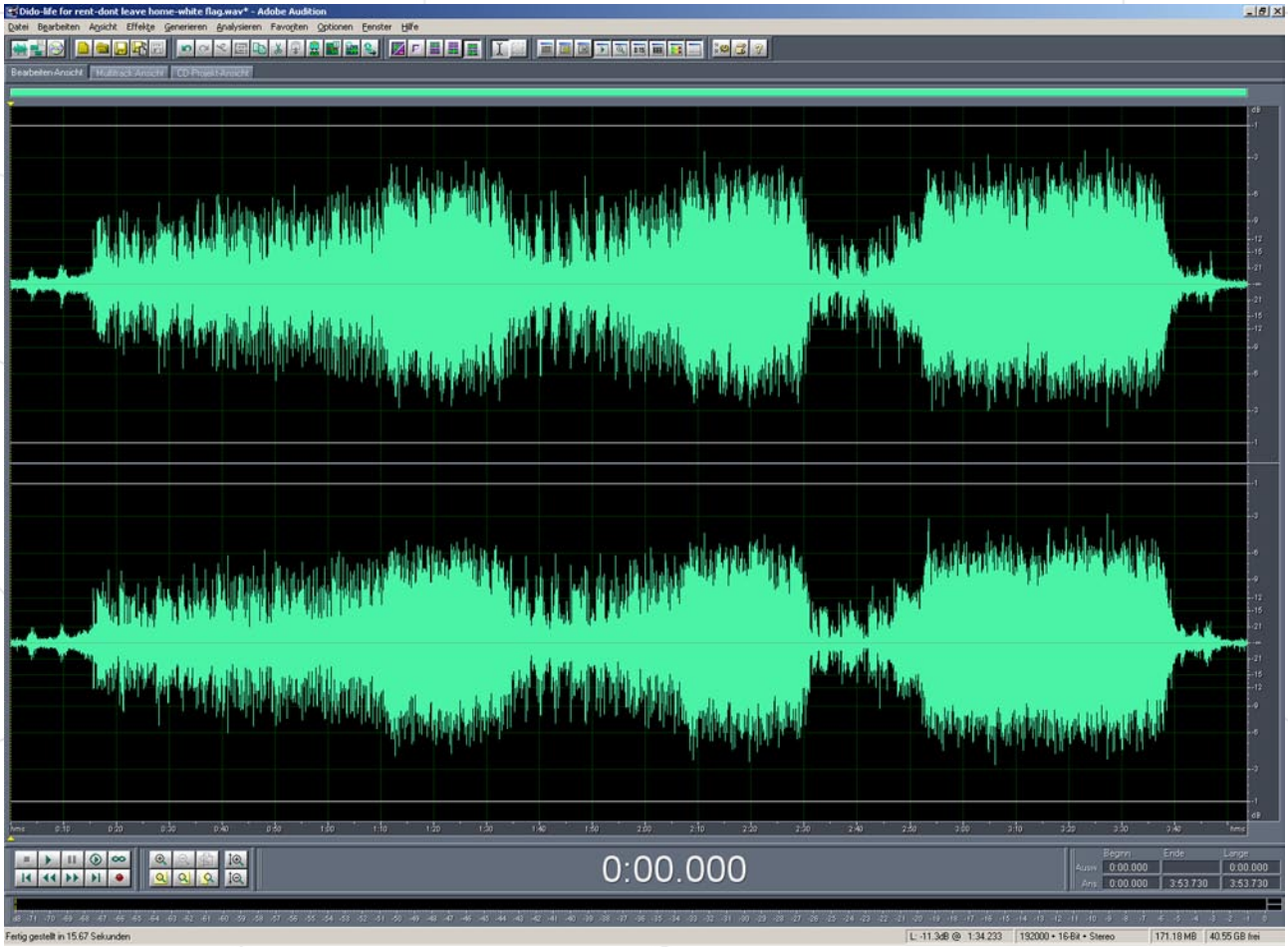
To make digital audio recordings in S/PDIF format with a PC, one will need a special PC audio interface card. There are external interface audio cards available on the PC market as well as internal ones.

However, with the PSD192 one can even record sampling rates up to 192kHz in 24Bits. For those sampling rates only a few cards support this digital format.

While using the USB-Output for recordings, the PSD192 offers 48kHz with 16Bits. The PSD192 is to be connected to a dedicated USB-Port.

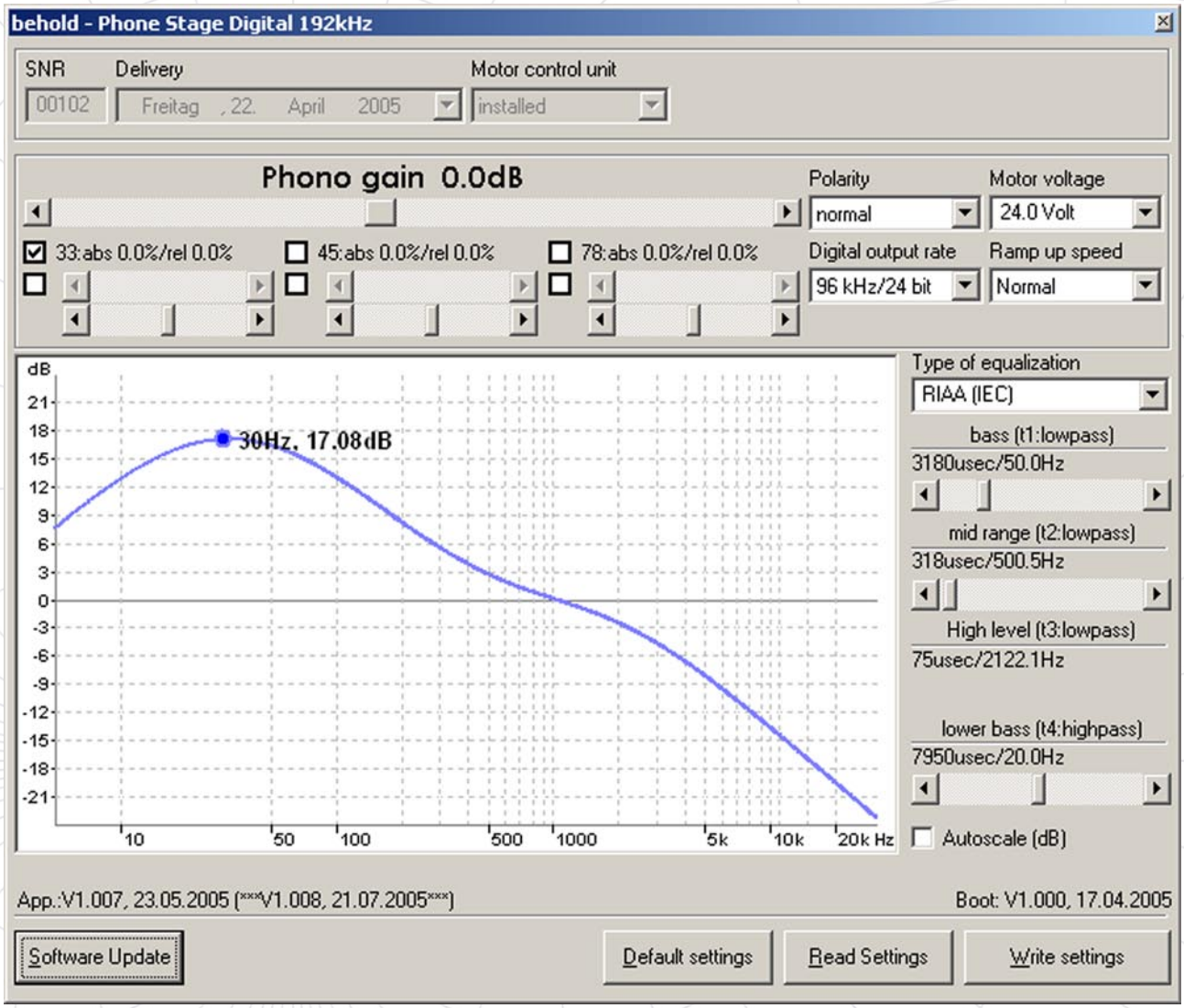
To make recordings, any commercially available audio software pakkage that supports the formats wanted can be used, because the PSD192 functions always as a standard USB-Audio device.

An example for a usable audio-software is suggested here:



The Configuration Software

In the configuration software myPSD192 all functionality of the PSD192 is available.



In this section the meaning of the fields and control elements will be shortly explained.

➤ **App.:** displays the current software version that is loaded in the PSD192 with its identification number and production date. When the display shows in between brackets a version indicated with stars, this is a version that can be uploaded to the PSD192 by pushing the Software Update button below.

➤ **Boot:** displays the loaded version of the boot-software. Only applicable for service or repair technicians.

Special menu buttons are:

➤ **Software Update:** this button will upload a software version into the PSD192. During the update, both blue LED's on the PSD192 will flash. Please wait until the PSD192 will start automatically after the update has been finished.

➤ **Default settings:** this button will reset all configuration data of the PSD192 back to the values entered at production. Please note, that also motor voltage and speeds are reset. Notice: before operating the motor again, first set the correct motor supply voltage!

➤ **Read Settings:** this button reads the previously stored values from the PSD192. Please note that all changes that were not stored are lost.

➤ **Write Settings:** after changing any parameter of the PSD192 configuration, one can consequently store the changes in the flash memory. Notice: changes that are not stored can be active but as soon as the PSD192 is disconnected form the mains power supply, all unstored changes are lost. The previously saved configuration will be loaded at the next start of the PSD192.

➤ **SNR/Delivery/Motor Supply unit:** the serial number and delivery date of the PSD192 is displayed here. Also the presence of the motor supply option is indicated here. These values are not be changed.

➤ **Phono Gain:** with the slider control below the amplification or attenuation of the audio signal can be set to the desired value, in steps of 0.1dB. A range of -10dB up to +12dB is available.

➤ **Polarity:** the PSD192 has the possibility to reverse the polarity of the audio signal.

➤ **Motor voltage:** using the PSD192 with motor supply, the operating voltage of the turntable synchronous motor must be set. Default is 24Vrms. The voltage can be set between 6.0Vrms and 24.0Vrms and is adjustable in steps of 0.1Vrms.

➤ **Digital output rate:** here the user can select at which sampling rate the PSD192 will send the digital data stream to the digital outputs (Toslink & Cinch). One can choose between 48kHz, 96kHz and 192kHz sampling rate, always using 24Bits word length. Default is 96kHz.

➤ **Ramp up speed:** the ramp up speed of the turntable platter with maximum torque is select here. While ramping up, not only the speed, but also the motor voltage is increased. This way the power consumption and the load on the PSD192 power supply remains low. One can choose from „no ramp up“ and very slowly. Seven different settings are available.

➤ **33/45/78:** to adjust the setting of the individual speeds always two slide controls can be used and two switches. The first switch on the left of the indicated speed starts the motor at this speed. The switch below enables the adjustment for the „absolute correction value“. These absolute values represent the calibration values for all speeds of the turntable. With the slide control on the right the calibration value are set. After calibration lock the setting by deactivating the switch. The slider below can now be used to set relative speeds, and can be used in the same way as changing the speeds with the front panel buttons.

➤ **Type of equalisation:** in this selection list the user can activate stored equalisation functions, change their names and by using the slide controls modify an existing function and store as a new one. This option should be used by experienced users only.

Technical Data PSD192 und PSD192M

The Phono Stage PSD192 is a digital Phono Preamplifier, the PSD192M additionally with motor supply. The technical data given here are valid at room temperature (+25°C), maximum gain and power supply of nominal 230V (200V bis 264V, 50Hz +/-3%), other wise noted:

Analogue Features of the Input Parameters:

Input voltage maximum (MM, min. Gain):	50mVrms = -26dBV
Input voltage maximum (MM, max. Gain):	3.1mVrms = -50dBV
Input voltage maximum (MC, 10Ω, min. Gain):	10mVrms= -40dBV @ 10Ω impedance
Input voltage maximum (MC, 10Ω, max. Gain):	0.63mVrms = -64dBV @ 10Ω impedance
Input gain switchable:	0dB to 24dB in steps of 6dB
Input impedance DC - 20kHz (MM):	47kΩ // 25pF
Input impedance DC - 20kHz (MC):	automatical
THD+N at 100Hz unweighted, with RIAA-Equalization:	<-85dB
THD+N at 1kHz unweighted, with RIAA-Equalization:	<-90dB
THD+N at 10kHz unweighted, with RIAA-Equalization:	<-100dB
Hum:	<-120dB (limit of measurement due to noise)
Maximum DC input offset voltage from outside:	+/- 20µV

Analogue Input Transfer Functions and A/D-Conversion:

Coupling:	DC (no lower cut off, no coupling capacitors)
Sampling frequency for analogue recording:	192kHz
Frequency response incl. ADC @ 96kHz:	+0/-0.15dB DC-20kHz; +0/-0.30dB DC-40kHz

Analogue Features of the Output Parameters:

Output voltage maximum:	2.4Vrms = 6.8Vpp = 7.6dBV
Output impedance DC - 20kHz:	22Ω resistive
Hum:	<-120dB (limit of measurement due to noise)
DC output offset voltage:	+/- 60 mV max.

Analogue Output Transfer Functions and D/A-Conversion:

Coupling:	DC (no lower cut off, no coupling capacitors)
Sampling frequency for analogue playback:	192kHz

Analogue Transfer Functions of the A/D-D/A-Conversion:

Coupling:	DC (no lower cut off, no coupling capacitors)
Sampling frequency	192kHz
Frequency response over all (ADC and DAC @ 192kHz):	+0/-0.15dB DC-20kHz; +0/-0.30dB DC-40kHz
Channel tracing:	0.15dB max.

Digital Features:

Sampling frequency of digital playback S/PDIF & Toslink:	48kHz, 96kHz or 192kHz, selectable
Word length of the digital playback S/PDIF & Toslink:	2x 24Bit
Sampling frequency of the digital playback via USB:	48kHz
Word length of the digital playback via USB:	2x 16Bit
Microprocessors:	STR710F & ADSP2184N
Working frequency of the ADSP2184N:	49.152MHz (256x 192Hz)
DSP word length / Accumulator of the ADSP2184N:	16Bit / 48Bit

Digital Output S/PDIF:

Coupling:	output transformer
Output impedance:	75Ω
Output voltage at 75Ω load:	550mVpp

Features of the Motor Supply:

Output frequency with nominal 33/45/78 RPM:	50Hz / 68Hz / 118Hz
Tuning range of the output frequency:	+/-50% of the nominal frequency
Step size of the output frequeny:	0.1%
Output voltage two-phase, nominal:	6Vrms to 24Vrms
Output voltage at 24V no load:	typ. 25.5Vrms
Step size of the output voltage:	0.1Vrms
Output voltage at 24V with 2x 75Ω load:	typ. 23Vrms
Output impedance at 24V with 2x 75Ω load:	typ. 8Ω each output
Output impedance at 16V with 2x 30Ω load:	typ. 3Ω each output
Maximum output power:	15W
Short circuit protection against all outputs and ground:	unlimited, electronical protection
Phase shift between the outputs:	90° fixed
Pin assignment SubD 9Pol socket:	Output 1: 1 and 6; Output 2: 2 and 7

Power Supply:

Power supply voltage single phase, nominal:	100V to 240V, 50 to 60Hz
Power supply voltage range operating:	85V to 264V, 47 to 63Hz
Power consumption phono stage only:	<5.2W, typ. 5.0W
Power consumption with motor supply no load:	<6.3W, typ. 6.1W
Power consumption with motor supply 2x 75Ω load at 24V:	<23.0W, typ. 22.5W

Connectors:

Connectors analogue inputs and outputs:	precision cinch sockets gold plated
Phono ground:	Allen screw M3 wrench size 2.5mm
Connector digital output S/PDIF:	precision cinch sockets gold plated
Connector digital output optical:	Toslink
Connector motor supply:	SubD 9Pol socket
PC-Connector:	USB-B type
Power supply connector:	3-pol plug according IEC60320/C05

Temperatures:

Temperature range operating (room temperature):	+10°C to +40°C
Temperature range storage (transportation also):	0°C to +70°C

Mechanical Figures:

Housing:	Aluminium-housing (2.5mm) with massive panel (8mm)
Screws to be opened by the user:	4x Allen screws M4 wrench size 2.5mm
Available colours:	Al-nature
Dimensions without connectors in mm (WxHxD):	200 x 52 x 144
Dimensions with connectors in mm (WxHxD):	200 x 52 x 155
Weight including motor supply:	ca. 1180g
Weight excluding motor supply:	ca. 1080g

Safety:

Electrical Safety:	according EN 60065: 2002
Safety against squirting water:	according IPX4

CE-Approval:

Emission:	EN 55013: 2000, EN 61000-3-2: 2000 and EN 61000-3-3: 1996
Disturbing influence:	EN 55020: 2000
Electrical discharge:	EN 61000-6-1: 2001

State of information: October 2005. Data given are subject of change without notice.

Contents of Shipment

- PSD192 (PSD192M) Digital Phono-Amplifier
- Power cord according IEC60320/C05 1.5m
- USB-cable 5m
- SubD-plug 9-pin soldering pins. (PSD192M)
- SubD-cover for 9-pin SubD-plug (PSD192M)
- Screwdriver for SW2.5
- CD-ROM containing software for PSD192
- Manual 34 pages

Company Information

Build in 1756

Manufacturing

Manufacturer:

Ballmann Electronica GmbH

Subsidiary and postal address for behold:

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Commercial register: Fuerth HRB 5822
VAT-ID-Nr.: DE168225369
Original share capital: € 150.000.-
President: Dipl.-Ing. Ralf Ballmann
Vice-President: Gisela Ballmann

Responsible for content and design: Ralf Ballmann
Authors: Peter Oberhofer and Ralf Ballmann

Status of information: October 2005. Data given are subject of change without notice.

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