soulution
nature of sound

3

360 D/A - converter

User manual

Dear client

We are proud that you have chosen a soulution D/A-converter. In doing so, you have acquired an audio component of outstanding quality with exceptional sonic performance which we are sure you will enjoy for many years to come.

It is important that you study this user manual carefully, step by step, before you install the 360 D/A-converter in your audio system. The manual contains information on how the 360 D/A-converter works, relevant safety instructions and recommendations for optimizing your entire audio system.

If you have any questions regarding the installation, setup or operation of your 360 D/A-converter, please do not hesitate to contact your dealer.

Enjoy!

soulution Team

CE-Declaration of Conformity

Spemot AG declares that this product conforms to the following directives and standards:

Low Voltage Directive 2014/35/EU

Electromagnetic Compatibility 2014/30/EU

FCC-Notice

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation.

If this equipment is found to cause unwanted or harmful interference to radio or television reception when switching on or off, the user is encouraged to take one or more of the following measures:

- adjust or relocate the receiving antenna of the affected appliance
- increase the separation between the equipment and the receiver
- connect the equipment into a mains outlet on a circuit different from that to which the receiver is connected
- consult your dealer or an experienced radio/TV technician for help

Disposal

According to Directive 2012/19/EU of the European Parliament, consumer electro-technical appliances must display the following symbol and must be disposed of separately. In the event of this component requiring disposal please do so in conformity with all locally applicable legal and environmental regulations.

Table of contents

1   Highlights

1.1   Power supply

A switched mode power supply followed by fast-switching DC-DC converters and low noise linear regulator provide the required supply voltages for the 360 D/A-converter. Switched mode power supplies provide supply voltages that are more stable and lower in noise than other power supply technologies.

1.2   DAC

With its 4 digital inputs (SPDIF, AES/EBU, Network, USB) provides connectivity to a wide selection of digital sources. A powerful DSP converts all incoming digital music signals to the DXD format, performs the zeroPhase processing and the LEEDH volume control. One PCM1792 in mono configuration per channel takes care of the digital to analog conversion of the music signals. The internal digital filtering of the chip is bypassed for optimal results. The passive reconstruction filter sports custom made high precision components ensuring stable filter characteristics, prerequisite for a perfect compensation with the zeroPhase technology.

1.3   Output stage

The powerful output stage (max 0.2A) can also drive long connecting cables to amplifiers easily. The wide bandwidth design (> 5MHz, -3dB) ensures lowest phase shifts in the audio band.

2   Safety advice:

User manual

⇨ Follow the safety advice
⇨ Keep this user manual

Mains supply

3 phase power cords with a ground conductor are mandatory.
Unplug the 360 from the mains:
⇨ before you adjust or manipulate mains cables
⇨ before cleaning the unit
⇨ during thunderstorms
⇨ when leaving the unit unused for longer periods

Cabling

Unplug the 360 from the mains while connecting or disconnect-
ing interconnect cables. Incorrect cabling may cause damage to
your 360, your audio system, or loudspeakers. Excessive vol-
ume due to inappropriate handling may cause hearing damage.

Transport

Use only the cart, stand, tripod, bracket or table specified by
the manufacturer or sold with the apparatus. When a cart is
used, take care when moving cart/apparatus combination to
avoid injury or tipping over.

Packing

To avoid the formation of water condensation within the 360,
allow it to reach room temperature before unpacking it. Keep
the original packing safely for future transport requirements.

Operation

Never run your 360
⇨ whilst the casing is open
⇨ with obstructed cooling slots
⇨ in high ambient temperatures (>40°C)
⇨ in proximity to heat sources like radiators, etc.
⇨ in areas of extreme humidity (for example in a humid cellar)
⇨ close to water (sink, bathtub, taps or similar facilities)

Cleaning

Use a soft and dry towel. We suggest using a nonabrasive mi-
crofiber towel. Please do not use any solvents or liquids.

Service

Service by a qualified person will be required if
⇨ the mains cable or the mains connectors are damaged
⇨ foreign substances or liquids have entered the 360
⇨ if the 360 has been rained on
⇨ the 360 exhibits any form of malfunction
⇨ the 360 has been dropped
⇨ if the casing is damaged

3   Scope of delivery

⇨   360 D/A - converter
⇨   IR remote control
⇨   Mains cable
⇨   Spare fuses
⇨   User manual
⇨   Set of shims

Please check the scope of delivery. If anything is missing or you notice any damage while unpacking, please contact your authorised dealer.

4   Setup

Remove the 360 D/A - converter carefully from the cardboard boxes and position it on a stable surface in an appropriate location ensuring cooling air can circulate and escape unhindered. Do not cover the surface of the 360 D/A - converter with a cloth or any other object as the complete chassis acts as a heat sink.

The feet of the 360 D/A - converter feature a constrained layer damping system which will mitigate vibrations away from the unit. The damping system is designed to work on any surface material. The feet shims are used in case the surface of your audio rack is not perfectly in level.

For best results we suggest using a dedicated audio rack system for all of your audio components.
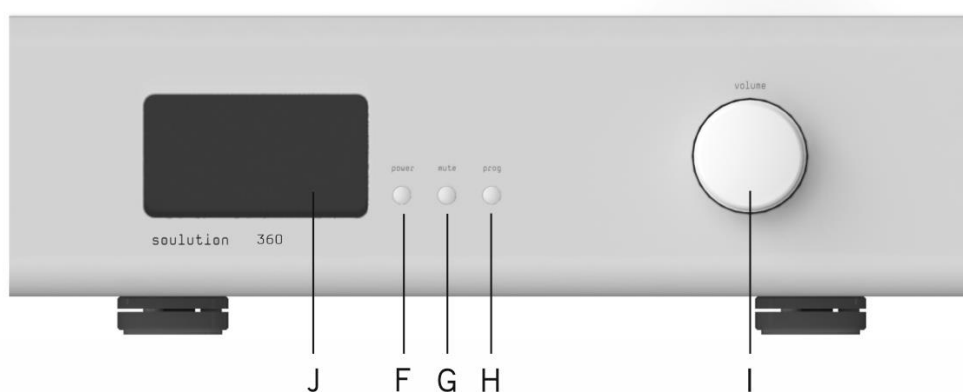
5   Rear and front view
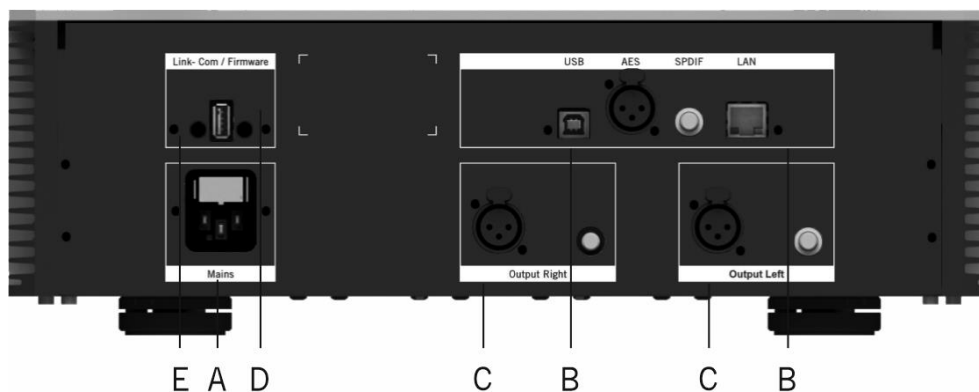
Rear view of the 360 D/A - converter

A) AC mains input	D) Link-com
B) D/A converter inputs	E) Firmware
C) Output	

Front view of the 360 D/A - converter

F) power button	I) Rotary knob
G) mute button	J) Display and IR eye
H) prog button	

6 Connections

6.1 AC mains input (A)

Connect the 360 D/A - converter to the mains supply. Please use a high-quality power cable for optimal sonic results. The 360 has no power switch. The device will enter standby mode as soon as it is connected to the mains supply.

⚠ **unplug mains**   Unplug the unit from the mains supply when
⇨ left unused for longer periods
⇨ adjusting the wiring of your audio system
⇨ during thunderstorms
⇨ Set the 360 to standby before unplugging it from the mains.

6.2 D/A-converter inputs (B)

The digital-to-analog converter features network, USB, SPDIF and AES/EBU inputs. A powerful DSP converts all digital signals to DXD, the zerophase technology ensures minimal phase errors along signal path.

AES/EBU and SPDIF

File format	Bit depth	Sampling rate
PCM (WAV, AIFF, FLAC, etc.)	16 - 24 bit	32 – 192 kHz
DSD (DoP)	1 bit	2.82 – 5.64 MHz

USB

The readable file formats depend mainly on the used player software. The following formats can be received by the 360's USB input:

File format	Bit depth	Sampling rate
PCM (WAV, AIFF, FLAC, etc.)	16 - 24 bit	32 – 192 kHz
DSD (DoP)	1 bit	2.82 – 5.64 MHz

The 360's USB input supports USB Audio Class 2.0. For operating systems such as Mac OS X, it supports driver free playback up to 24bits/192kHz. Under Windows 8 and lower a specific USB Audio Class 2.0 driver is required for playback of files with sampling rates > 96kHz.

Network

The 360's network input will be recognized as „UPnP™ AV/DLNA Media Renderer device" and can be accessed from your media server.

File format	Bit depth	Sampling rate
FLAC (Free Lossless Audio Codec)	16-24 bit	44.1 – 192 kHz
WAV (Waveform Audio File Format)	16-24 bit	44.1 – 192 kHz
MP3 (Mpeg Audio Layer 3)	16-24 bit	44.1 – 192 kHz
ALAC (Apple Lossless Audio Codec)	16-24 bit	44.1 – 192 kHz
AAC (Advanced Audio Coding)	16-24 bit	44.1 – 192 kHz
AIFF (Audio Interchange File Format)	16-24 bit	44.1 – 192 kHz
DSF and DFF (DSD stream file)	1 bit	2.82 – 5.64 MHz
DXD (Digital eXtreme Definition)	24 bit	352.8 kHz

6.3 Output (C)

Due to the exceptional load stability there are no restrictions regarding the selection of your connecting cables. For long cable lengths we recommend using balanced cables.

6.4 Link-Com (D)

The Link-Com interface will turn-on/off connected components.

6.5 Firmware (E)

The USB input is provided for firmware updates only. For detailed instructions please refer to section 10 Firmware Update.
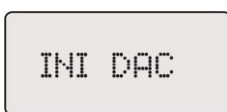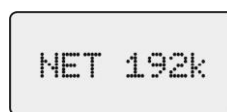
7 Operation

7.1 Power (F)

The power (H) button turns on the 360 D/A converter. The start-up sequence takes a short while as the power supplies for the different sections of the circuit are initiated. Progress will be reported in the display (J). Once the unit is ready to operate it will show the active input and volume level in the display (J).

⋮	INI DAC	NET 192k
Standby	Power-up squence	Ready to operate

If the 360 D/A - converter is on, the power (H) button will put the unit back into standby (power consumption <1W).

7.2 Mute (G)

The mute (G) button disconnects or reconnects all outputs from the analog circuits of 360 D/A - converter.
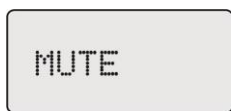
MUTE

Mute

7.3 Prog (H)

The 360 D/A -converter can be configured to suit the individual requirements of your audio system. Pressing the prog (J) button (de)activates the configuration menus.

7.4   Rotary knob (I)

The multi-purpose rotary knob is used to control the volume, select the input, dim the volume, and to select the configuration menus of the 360 D/A - converter.

<u>Operation-Mode</u>

Turning the rotary knob (N) changes the volume.

short   **Pressing** the rotary knob for less than 1 second (de)activates the Volume-Dim function.

long   **Pressing** the rotary knob for more than 1 second activates the Input select mode.

Turning the rotary knob while the unit is in input select mode will in/decrement the input.

<u>Configuration mode</u>

Turning the rotary knob (N) selects the desired configuration function.

Pressing the rotary knob (N) confirms the selected configuration function and activates the value range (3 LEDs lit).

Turning the rotary knob (N) selects the desired value.

Pressing the rotary knob (N) confirms the new value.

7.5   Display (J)

Normal mode   **Configuration mode**

NET 192k   BR. LOW

1   2   3   4
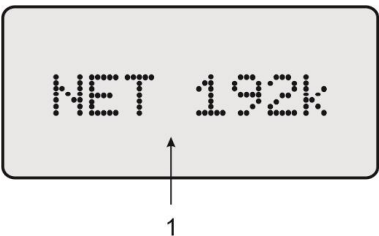
1)   Selected input: SPDIF, AES/EBU, USB, NETWORK
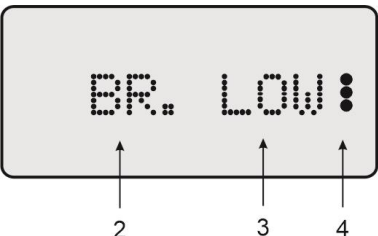
2)   Configuration function
3)   Value of function
4)   LEDs are lit whilst values are changeable

8   Configuration

Function	Values	Remarks
`PWR-MODE` Power-Mode: Defines start-up behaviour	`PWR-NORM ▮`	Power-up with power-button, default value
	`PWR-LINK ▮`	360 waits for external LINK Signal
	`PWR-AUTO ▮`	Switches on automatically as soon as mains voltage is active.
`START-IN` Start-Input: Defines active input after switch-on	`S-IN S/P`	Start-Input: S/P default value
	`S-IN NET ▮`	Start-Input: Network
`D-FILTER` Digital Filters: Selects the upsampling fil- ter	`D-F  LIN`	LIN: Linear phase
	`D-F  MIN`	MIN: Minimal phase
	`D-F LINA`	LINA: Linear phase with apodizing Default value
	`D-F MINA`	MINA: Minimal phase with apodizing
`PHASE-EQ` Phase-EQ: (de) activates the zero- Phase technology	`P-EQ  ON`	ON: zeroPhase technology is active default value
	`P-EQ OFF`	OFF: zeroPhase technology not active
`VOL-MODE` Volume Mode: (de) actives volume control	`VOL LEED`	LEEDH control default value
	`VOL  OFF`	Volume mode OFF

Function	Value	Remarks
S-VOLUME Start-Volume: Defines the volume level after switch-on	`S-VOL 10`	Minimal Start-Volume
	`S-VOL 30`	Default value
	`S-VOL 40`	Maximal Start-Volume
MAX-VOL MAX-Volume: Limits the volume level	`M-VOL 40`	Minimal MAX-Volume
	`M-VOL 65`	Suggested MAX-Volume
	`M-VOL 90`	Default value
DIM-VOL DIM-Volume: Defines the volume level of the DIM function	`D-VOL 10`	Default value
	`D-VOL 10`	Default value
	`D-VOL 40`	Maximal DIM-Volume
BALANCE Balance: Defines level difference be- tween left and right channel	`BAL <-9`	Balance 9dB left
	`BAL 0`	Balance center (OFF) Default value
	`BAL ->9`	Balance 9dB right
POLARITY Polarity	`POL 0`	Polarity in phase, Default value
	`POL 180`	Polarity 180°, inverted

Function	Value	Remarks
`BRIGTHN.` Brightness: Defines the brightness of the display	`BR.  LOW`	Low
	`BR.  MID`	Mid
	`BR. HIGH`	High, Default value
`REMOTE` Remote-ID: Defines the Remote-ID for the 360.	`REM  DAC`	Default value

	`REM Pre1`
	
	`REM  OFF`
		The 360's Remote-ID can be changed. Ensure that the ID of the remote control gets changed accordingly (see chapter 9)

`DEFAULT` Default-Values Activates the default values for all functions.	`LOAD  NO`	No action
	`LOAD YES`	Loads the default values.
	`DONE`	
`FIRMWARE`	`FW-00001`	Firmware version
	`REV-0047`	Firmware revision

9   Remote control

Button	Pre-Mode	CD-Mode
(1) IR-transmitter	Operation until 5m distance and angel of ±45°.	
(2,3) ▲ ▼	Volume +/-	
(4) DIM / ▶ ❙❙	Volume-Dim	Play/Pause
(5/6) ◀ ▶	Select +/-	Next / Previous track
(7) ↵	Enter Function for Program-Mode	
(8) P	(De)activates Program-Mode	
(9) 🔇	Mute	-
(10) ⏻	ON / OFF	
(11) ⏏	-	Open/Close
(12) PRE	-	Activates PRE-Mode
(13) CD	Activates CD-Mode	-

<u>Change of Remote Ctrl ID:</u>

Press the respective buttons for approx. 5 seconds.

⇨   Pre 1:   ◀ (6), ▶ (5), ⏻ (10)
⇨   Pre 2:   ◀ (6), ▶ (5), 🔇 (9)
⇨   Phono   ◀ (6), ▶ (5), ↵(7)
⇨   DAC   ◀ (6), ▶ (5), P (8)

<u>Exchange of batteries (2 x AAA):</u>

⇨   Open the battery tray on the rear side.
⇨   Insert the batteries into the tray as indicated.
⇨   Ensure correct polarity of the batteries.
⇨   Close the tray with corresponding screw.
⇨   Dispose the exhausted batteries

10   Firmware Update

USB-Stick:

The firmware of all soulution products can be updated via the USB port on the back panel. To update firmware, please prepare a USB stick (FAT32 formatted, UBS2.0) containing the required firmware data.

You can find the latest firmware for your 360 D/A - converter on our website www.soulution-audio.com. Unzip the downloaded .zip file and copy the firmware files to the root directory of the USB stick. Make sure there are no other files or folders on the USB drive.

Update-process:

⇨   Prepare the USB stick with the firmware files (no other files should be present).
⇨   Unplug the unit from the mains supply.
⇨   Insert the USB stick into the USB interface "Firmware".
⇨   Connect the unit to the mains supply.
⇨   Follow any instructions in the display.
⇨   Once the new firmware has been successfully loaded, the 360 D/A - converter will be in standby mode.
⇨   Power up the 360 D/A - converter.
⇨   After the 360 has completed its start-up sequence, press the prog key.
⇨   Select configuration function LOAD-DEFAULT and confirm with YES.
⇨   Configure the 360 D/A - converter to suit your requirements.

11   Troubleshooting

No Display   Check the mains connection, the fuse of your house installa-
                              tion, the fuse of the 360 D/A - converter and the brightness
                              function. For the DISPLAY-OFF setting, the display is switched
                              off during operation.

No music   ⇨ Check the cabling of your audio system
                              ⇨ Check whether the correct input is selected
                              ⇨ Check whether the source component is muted

PSU FAIL...   The 360 monitors all necessary supply voltages. If a supply
                              voltage fails, the 360 will switch itself to MUTE with the corre-
                              sponding error code shown in the display.

12   Service

If you cannot identify or rectify a fault by following the troubleshooting measures,
please disconnect the 360 D/A - converter from the mains supply and contact your
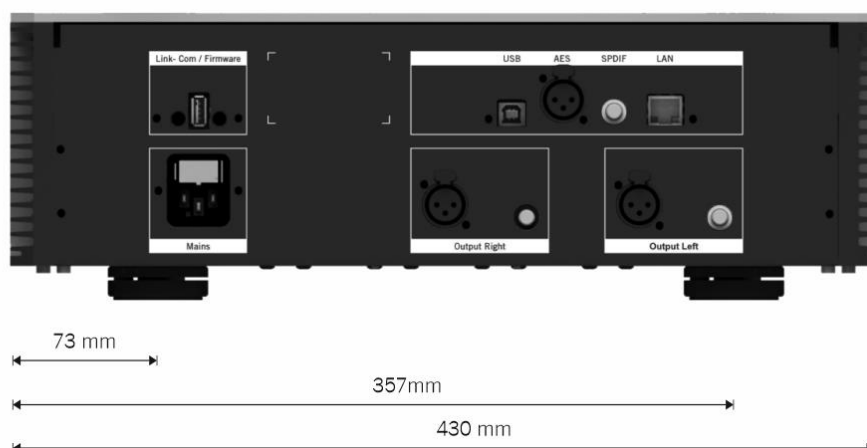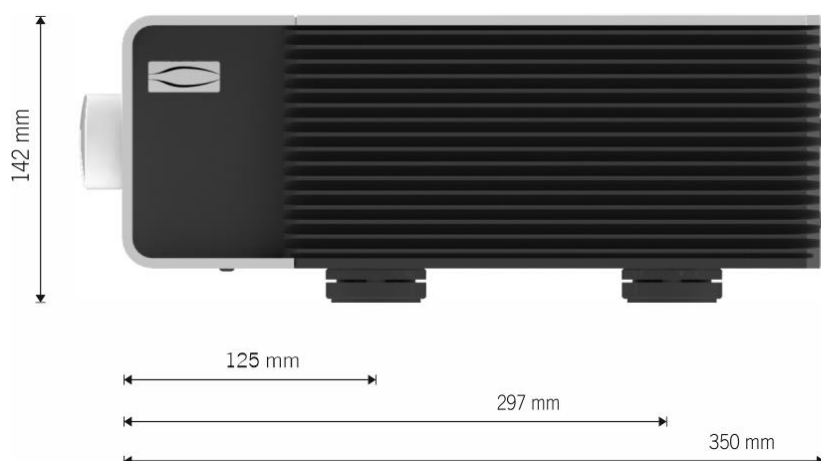dealer.

13   Specification

General		
Nominal voltage	Model 100-240V	100 - 240 V, 50-60Hz
	Model 220V/60Hz	220 V, 60Hz
Nominal consumption		200 W
Consumption	Standby	<0.5 W

D/A converter	(optional)	
Sensitivity	SPDIF, AES/EBU	0.3 – 5 V
	USB, Network	0.4 – 2.5 V
Impedance	SPDIF	75 Ω
	AES/EBU	110 Ω

Output		
Frequency response		DC – 200 kHz
Output voltage	Balanced	4 Vrms
	Unbalanced	2 Vrms
Peak output current		0.2 A max.
Attenuation	Volume control	-79 to 0 dB
Output impedance	Balanced	10 Ω
	Unbalanced	5 Ω
THD+N		<0.0003 %
Spot noise		< - 140 dBV/√Hz

Dimensions		
Dimensions		430 x 350 x 142 mm
Weight		ca. 10 kg

Technical specifications are subject to change without prior notification.

14   Dimensions

142 mm

125 mm

297 mm

350 mm

soulution   360

power   mute   prog

volume

430 mm

Link- Com / Firmware

USB   AES   SPDIF   LAN

Mains

Output Right

Output Left

73 mm

357mm

430 mm

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