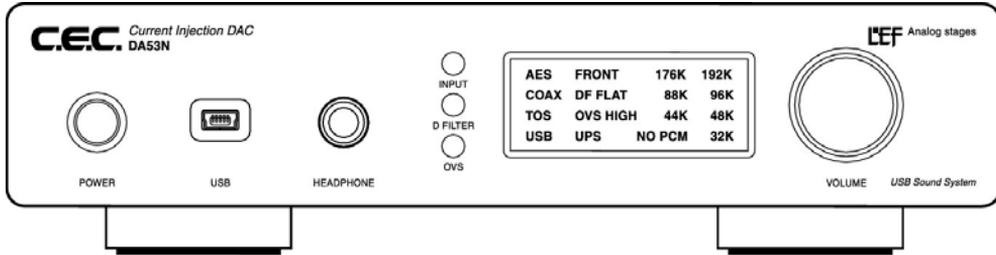


# Digital to Analogue Converter

# DA53N

## Owner's Manual



**C.E.C.**

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## Introduction

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Thank you for purchasing DA53N.

Please read through and refer to this Owner's Manual to use your DA53N safely and adequately.

It is recommended that you keep the unit's packaging available for future transportation needs.

## Features

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- DA53N is a very high grade digital to analogue converter with unmatched flexibility for sound matching.
- DA53N's CI (Current Injection) current to voltage converter integrates the DAC into the current system of a special designed and feedback-free amplifier with better sound quality than OP-amp-designs, excellent measurement results and the shortest possible signal path.
- DA53N works perfectly with all kind of digital sources. AES/EBU, Coax., Toslink, and USB inputs are available.
- DA53N uses a low noise high grade switching power supply with an active primary power cleaning section. Low noise switching is achieved by controlling Slew Rate of Voltage and Current.
- DA53N uses just a very high grade of part quality. PCM1796, the latest CI modules, balanced current capacitors, induction free polystyrene capacitors, low tolerance metal film resistors, gold plated 2-layer PCB
- DA53N has 2 different digital filters: A standard filter with super linear frequency response but ringing, or a ringing-free, pulse-optimized filter with a softer roll-off at the top frequency range. The typical pre- and post-ringing of digital FIR filters does not exist in the analogue nature. Also sample rate converter, that can eliminate jitter very efficiently, is available.
- DA53N offers different oversampling frequency settings and thus allows the choice between best filtering with strongest signal proceeding (OVS HIGH = 128fs) down to best filter quality with low signal alternation, but simplest filtering (OVS LOW = 32fs).
- DA53N has a volume controlled output stage which offers a very high grade headphone listening as well as a connection to a power amplifier or active speakers.

## Cautions regarding handling

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- Before pushing the analogue output FIXED/VARIABLE button, turn the volume of DA53N as well as the amplifier connected and power off all devices. Changing to FIXED gets the maximum analogue output level, which may result in damage to amplifier and speakers due to excessive input.
- When DA53N is connected to an amplifier without volume control, never set the button to FIXED.
- Before changing the digital input, take off the headphones and turn the volume low, otherwise changing noise or high sound pressure from high input source may result in hearing impairment.
- Be sure to take off the headphone and lower the volume before input change.
- When listening to the speakers or headphones connected to the external amplifier, turn the amplifier's volume low before changing DA53N's input. Changing the input keeping the volume high may cause changing noise or high sound pressure from high input source, and may result in speaker/headphone damage or hearing impairment.

## Important Safety Instructions



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to potential shock hazards within the product's enclosure.



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

**WARNING : TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions
- 5) Do not use DA53N near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install DA53N near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) (For USA, Canada: ) Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades, with one blade wider than another. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet. (For European Countries: ) Do not defeat the safety purpose of the grounding-type plug. This plug has two poles and a third grounding hole. The third hole is provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.

- 10) Protect DA53N's power cord from being walked on or pinched, especially around the plugs, convenience receptacles, and where it exits DA1N's casing.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Only use DA53N with a cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the unit. If using a cart, exercise caution when moving the cart unit combination to avoid injury from it tipping over.
- 13) Unplug DA53N during lightning storms or when leaving it unused for extended periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when DA53N itself, its power-supply cord, or plug has been damaged in any way, when liquids have been spilled onto DA53N, when foreign objects have fallen into DA53N, when DA53N has been exposed to rain or moisture, when DA53N does not operate normally, or when the unit has been dropped.



## Caution

- Do not expose DA53N to drips or splashes.
- Do not place any objects filled with liquids, such as vases, on the unit.
- Do not install DA53N in a confined space, such as within a bookcase or similar piece of furniture.
- Plug the AC power cord into an easily accessible AC wall outlet, so it can be quickly unplugged in case of emergency.
- DO NOT REMOVE THE PROTECTIVE HOUSING WITH A SCREWDRIVER.
- USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.
- IF DA53N SEEMS TO BE MALFUNCTIONING, CONTACT A QUALIFIED SERVICE STATION. DISCONTINUE USE OF ANY MALFUNCTIONING UNIT.

### For CANADA:

#### AC POWER CORD CONNECTION

#### CAUTION :

TO PREVENT ELECTRIC SHOCK, MATCH THE BLADE WIDTH OF THE PLUG TO THE SLOT WIDTH. THE PLUG MUST BE FULLY INSERTED TO THE SLOT.

## Handling Precautions

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### 1. Connecting Other Devices

Unplug DA53N's AC power cord from the outlet before connecting or disconnecting other devices. Exercise caution when handling the AC power cord. When disconnecting the AC cord from a socket, make sure you pull the plug, and not the cord itself.

### 2. Turning Power ON/OFF

Your system components should be turned ON/OFF in the following order to avoid generating noise from your headphones and speakers, and damaging the headphones and speakers themselves or other devices:

Turning power ON: Turn DA53N's volume to the minimum and power ON first, before turning ON the amplifier connected to DA53N.

Turning power OFF: Turn DA53N's volume to the minimum and power OFF at last, after turning OFF the amplifier first.

### 3. Handle with Care

Avoid exerting excessive force on the cabinet, the volume knob and buttons.

### 4. Installation

Use of an audio rack is recommended to maximize the sound quality and performance of DA53N.

Installation and use of DA53N in the locations described below may cause deterioration in sound quality or malfunctions.

Locations exposed to direct sunlight, such as windowsills, and other exceptionally warm locations, such as near heating appliances (surrounding temperature higher than 30°C), or exceptionally cold locations (surrounding temperature lower than 5°C), may prevent DA53N from functioning adequately.

Damp locations exceeding 90% humidity may cause malfunction.

Dusty locations may cause DA53N to malfunction.

Otherwise, avoid installing DA53N close to other transformers and electrical motors. Also, avoid mounting DA53N on surface that may be affected by vibration.

### 5. Avoid Electrostatic Discharge

Like all complex electronic devices, DA53N is sensitive to electrostatic discharge. A discharge may cause malfunction or damage.

### 6. Avoid Lightning Strikes Damages

Disconnect the AC power cord from the AC outlet when there is a thunderstorm in your vicinity.

### 7. Condensation

When DA53N has been brought into a warm room when the exterior temperature is cold, or when the room temperature rises sharply from using a heater, condensation may occur from both inside and outside the unit, hampering its performance. If this happens, leave DA53N unused in the room for 1 to 2 hours (depending on the amount of condensation), so as to bring the unit's temperature closer to the room temperature. The condensation should go away gradually.

### 8. Listening Etiquette

Excessive sound pressure from headphones and earphones can cause hearing impairments. Take care not to increase the volume too much.

When adjusting the sound volume level, make sure you do not disturb other people and your neighborhood.

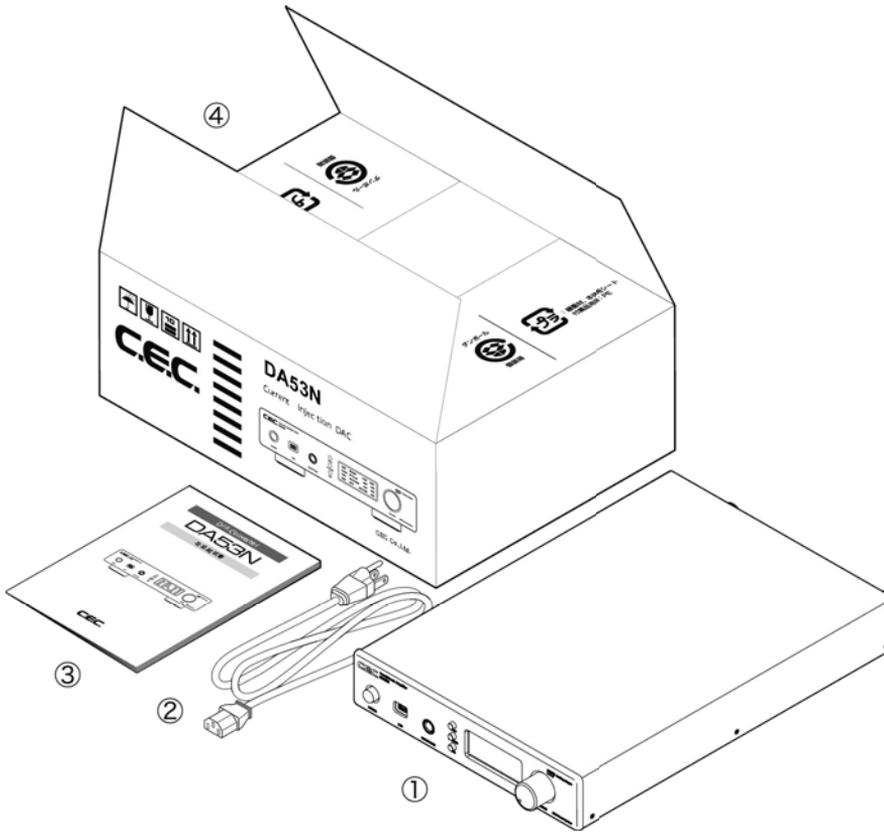
## Accessories

The packaging of DA53N should contain the following:

1. DA53N unit
2. AC Power Cord
3. Owner's manual

NOTE: Keep the packaging available for future transportation needs.

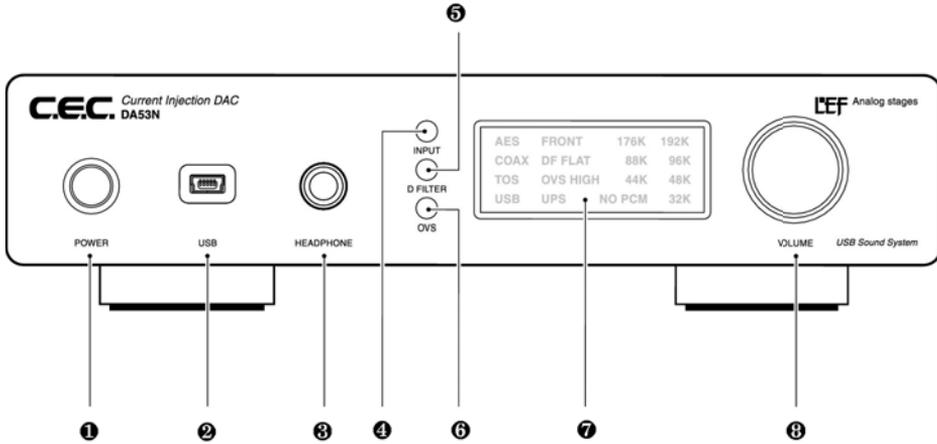
The AC power cord is for use with DA53N exclusively, and should not be used for other devices.



## Maintenance

- DA53N requires no periodic maintenance and contains no user-serviceable parts. Contact your dealer or an authorized CEC service center for inspection and repairs in case of malfunction.
- If the surface of the DA53N enclosure is soiled, wipe with a soft cloth or use diluted neutral cleaning liquid. Be sure to remove any fluid completely. Do not use thinner, benzene, alcohol, chemical cloths or bleaching agents as these may damage the surface of the DA53N enclosure. Also avoid using aerosol insecticides near the unit.
- If dust should have accumulated on the unit, remove it with stick tape (e.g. Scotch tape). Make sure not to touch the enclosure with any tools or hard parts.

## Front Panel Functions



### 1 POWER button

Push the POWER button to turn DA53N ON respectively OFF.

### 2 USB input

Connect to a computer via standard USB cable (USB A-type – USB mini B-type). This way DA53N can work as an external computer sound system, compatible with the USB-1.1 standard. No driver installation on the computer is required. Sampling frequencies up to 48kHz are supported. The USB cable should be well shielded and better not use ferrite filters.

### 3 HEADPHONE jack

Connect a standard 6.3mm headphone plug to the HEADPHONE jack. Use an adaptor for different headphone plugs. For Volume control use the 8 VOLUME knob. Headphone should be plugged at low VOLUME.

### 4 INPUT selector button

Push the INPUT button to select a digital input AES (AES/EBU), COAX (COAXIAL), TOS (TOSLINK), USB (B-type), or FRONT (USB mini B-type). The selected INPUT lights up in the display, and the display shows the sampling frequency once DA53N detects the digital input signal.



Lower the volume before changing the input to avoid changing noise, sudden big sound, or headphone / speaker damage!

### 5 D FILTER (DIGITAL FILTER) selector button

Push the D FILTER button to select a digital filter FLAT or PULSE. When FLAT is selected, DF FLAT lights up in the display. When PULSE is selected, the indicator is off.

### 6 OVS/SRC ( $\Delta\Sigma$ -OverSampling / Sample Rate Converter) selector button

Press the OVS button to select an oversampling rate HIGH or LOW, or the sample rate converter (SRC=UPS). When HIGH is selected, OVS HIGH lights up in the display. When LOW is selected, the indicator is off. When sampling rate converter is selected and on, UPS lights up in the display.

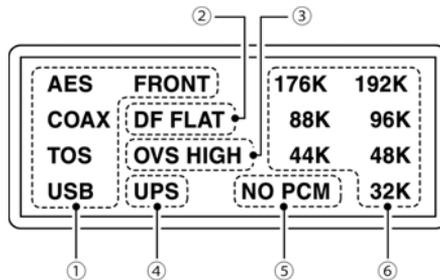
(1) OVS HIGH is the highest possible filtering with strongest signal proceeding and "smoother" sound. The actual oversampling rate varies with input signal's sampling frequency:

32K, 44K (44.1k), 48K: 128fs / 88K (88.2k), 96K: 64fs / 176K, 192K: 32fs

(2) OVS LOW (not light up) is the filter with lowest signal alteration and very "open" and "dynamic" sound by simplest filtering (32fs).

(3) UPS activates the sample rate converter (upsampler) and always sets the oversampling rate to 32fs.

UPS (sample rate converter) operation reduces jitter and relocks the input signal to 96kHz. For low jitter input, bypass SRC may result in better sound.



## ⑦ DISPLAY

### ① Input indicator

A selected input lights up in the display. AES=AES/EBU, COAX=Coaxial, TOS=Toslink, USB=USB B-type, FRONT=USB mini B-type.

### ② Digital Filter indicator

When FLAT is selected, DF FLAT lights up in the display. When PULSE is selected, the indicator is off.

\*For detail of Digital Filter refer to page 14 ⑤.

### ③ $\Delta\Sigma$ -Oversampling Rate indicator

When HIGH is selected, OVS HIGH lights up in the display. When LOW is selected, the indicator is off.

### ④ Sample Rate Converter (Upsampling) indicator

When the Sample Rate Converter (SRC=UPS) is ON, UPS lights up in the display.

### ⑤ NO PCM

When DA53N does not detect any digital input signal, NO PCM lights up.

AES/EBU and SPDIF (Coax & Toslink) receives the digital signal in PCM format from any digital audio devices, and USB receives the signal in Packet format from PC.

If DA53N detects encoded signals, NO PCM lights up, and the output is muted.

### ⑥ Sampling Frequency indicator

The incoming sampling frequency at a selected input lights up in the display, e.g. 44K (44.1kHz) in case of CD.

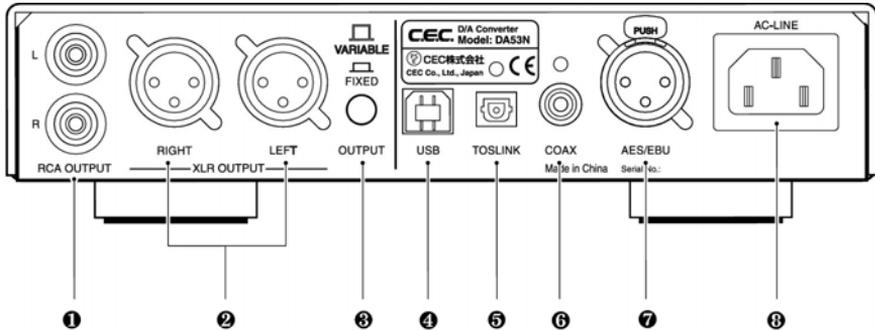
\*Some SACD or DVD players even equipped with a digital output terminal may not produce a digital signal due to the source being played. When there is no digital output from the player DA53N shows NO PCM in the display. In another case, some players convert the digital output signal lower than the sampling frequency of the original source such as copy-protected disc. The HD53N's display may show a down-converted sampling frequency but not the original one. This depends on the player's specification. Both cases are not caused by an error on DA53N. Check player's manual.

## ⑧ VOLUME control knob

Turn the VOLUME knob clockwise to increase or turn counterclockwise to decrease the headphone's volume.

When the analogue output is set to "VARIABLE", the VOLUME knob works also for adjusting the analogue output level. The switch is located at the rear panel. For detail refer to page 10 ④.

## Rear Panel



### Analog outputs

#### ❶ RCA(Unbalanced)

Standard RCA analogue signal output terminals for connecting any amplifier.

#### ❷ XLR(Balanced)

Balanced analogue output using standard XLR terminals. Pinning: 1=GND, 2=Hot, 3=Cold. This should be the preferred connection when wiring DA53N to any amplifier.

#### ❸ FIXED/VARIABLE button

When DA53N's analogue output is connected to an amplifier with volume control function, set the button to FIXED (the button is in lower position).

When DA53N's analogue output is connected to active speakers or power amplifier without the volume control function, set the button to VARIABLE (the button is in higher position) to adjust the analogue output level by turning the DA53N's VOLUME knob on the front panel.

Note: When VARIABLE is ON, the DA53N's VOLUME knob works to adjust the output level for both headphone and analogue outputs. In case of listening to headphone the amplifier connected to the analogue output should be powered off.



When DA53N is connected to an amplifier or active speaker without volume control function, never set the button to FIXED. FIXED output is at maximum level that may result in amplifier or speaker damage.

To avoid any accident by mistake, be sure to push the FIXED/VARIABLE button only after setting the volume to minimum at DA53N as well as at the amplifier connected to DA53N. And power off all devices.

## Digital Inputs

### ④ USB (B-type)

Connect to a computer via standard USB cable. This way DA53N can work as an external computer sound system, compatible with the USB-1.1 standard. No driver installation on the computer is required. Sampling frequencies up to 48kHz are supported. The USB cable should be well shielded and better not use ferrite filters.

### ⑤ TOSLINK (Optical)

Connect to any digital audio device using an optical fiber cable with "TOSLINK" connectors. This input supports sampling frequencies up to 96kHz.

### ⑥ COAXIAL (RCA)

Connect to any digital audio device using a 75 Ohm coaxial cable. This input supports sampling frequencies up to 192kHz.

### ⑦ AES/EBU (Balanced XLR)

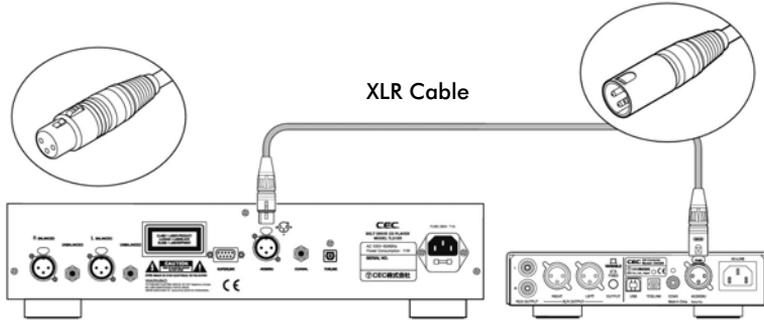
Connect to any digital audio device using a 110 Ohm balanced XLR cable. This input supports sampling frequencies up to 192kHz and should be the preferred standard for common SPDIF connections.

### ⑧ AC LINE

Connect the provided AC power cord to the AC LINE inlet.

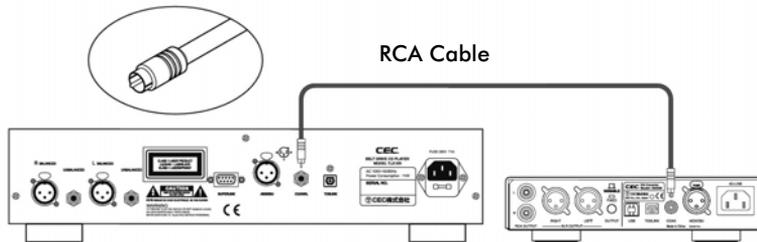
## SPDIF Connections

### AES/EBU Connection



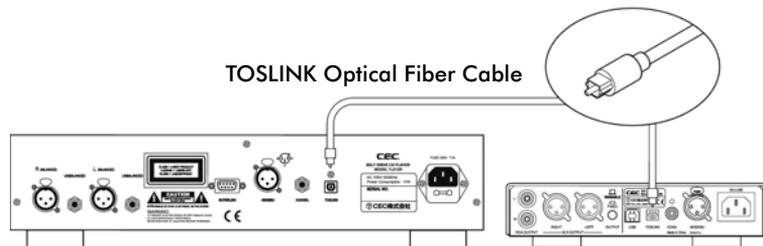
Connect to the AES/EBU terminal of any compatible digital audio device with a 110 Ohm XLR cable.

### COAXIAL Connection



Connect to the COAXIAL terminal of any compatible digital audio device with a 75 Ohm COAXIAL (RCA) cable.

### TOSLINK Optical Connection

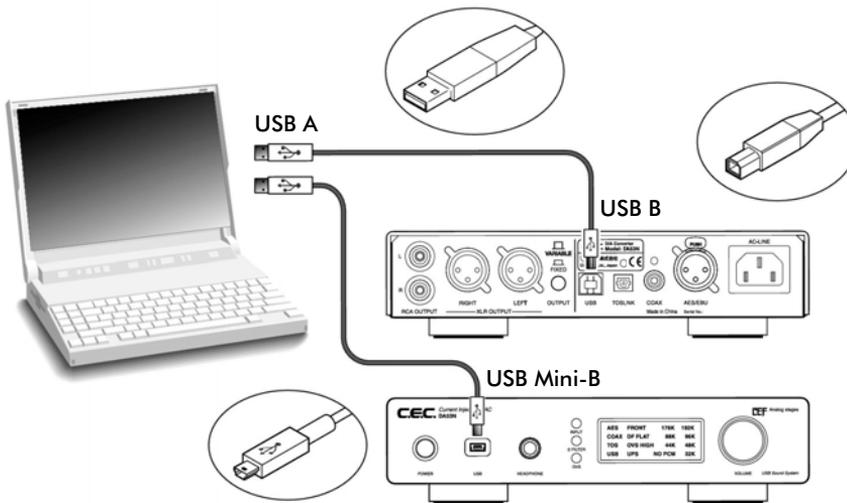


Connect to the TOSLINK terminal of any compatible digital audio device with an optical cable.



TOSLINK is using an optical fiber. Do not stare directly at the infrared light coming from the cable end to avoid damage to your eyes.  
Do not bend the cable too much and keep unused TOSLINK terminals covered.

## USB Connections



Connect USB B or USB mini B plug to the DA53N's USB terminal on rear or front panel. This way DA53N can be used as an external computer sound system. After connecting DA53N is automatically registered to the operating system as USB Audio DAC, but you may have to set your computer to route the sound signals to DA53N instead of the internal sound system. DA53N works with Windows Vista, Windows XP, Mac OSX and Linux. In case of special operating system setups without automatic USB scanning or limited user rights, you may ask your system administrator.

## Operation

- ① Push the Analog output FIXED/VARIABLE bottom on the rear panel to select a proper analog output setting for the amplifier connected to DA53N. FIXED is for an amplifier with volume control function and VARIABLE is for an amplifier without volume control function, i.e. power amplifier, and for active speakers. **Never set the button to FIXED for any power amplifier or active speaker without volume control!**
- ② Push the POWER button to turn DA53N on. A selected input LED will blink in the display. About 10 seconds later all current functions light up and the unit is ready for use.
- ③ Power on the digital audio source or computer connected to DA53N first, then amplifier at last. Make sure DA53N's and amplifier's volume positions are at the minimum.
- ④ Select an input. The input sampling frequency will light up in the display, e.g. 44K(44.1kHz), 48K, 88K(88.2kHz)... as soon as DA53N detects a valid PCM signal. If there is no connection to the selected input, or the signal is not a PCM Digital Audio signal (like coded signals), NO PCM will light up in the display.

AES	FRONT	176K	192K
COAX	DF FLAT	88K	96K
TOS	OVS HIGH	44K	48K
USB	UPS	<b>NO PCM</b>	32K

- ⑤ Push the D FILTER button to select a digital filter FLAT or PULSE. FLAT features linear frequency response up to 20kHz. PULSE features soft roll-off and ringing free playback. When selecting FLAT, DF FLAT lights up in the display. PULSE results in wider sound stage and dynamic sound. During PULSE the indicator is off.

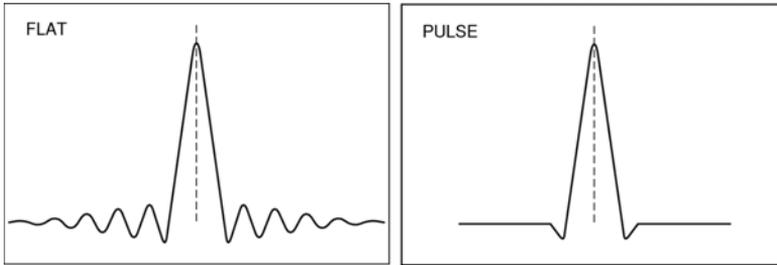
AES	FRONT	176K	192K
COAX	<b>DF FLAT</b>	88K	96K
TOS	OVS HIGH	44K	48K
USB	UPS	NO PCM	32K

The FLAT digital filter is very common in digital audio items. The frequency response is almost perfect, but such filter cause "ringing" in the time domain. Some energy of a pulse signal is distributed in the time domain, before and after the pulse centre. Any ringing before the signal does not exist in nature.

The PULSE filter avoids the problems in the time domain and thus has a very good response in the time domain. The frequency response of the PULSE digital filter shows a soft roll-off at high frequencies. This results in about -2dB at 20kHz with an input sampling frequency of 44.1kHz.

For higher sampling frequencies the roll-off is irrelevant and the PULSE filter is the best choice. This is also true for SRC (=UPS) operation.

For 44.1kHz and 48kHz the better result may depend on the whole system as well as personal preferences.



Needle Pulse response reproduced with Digital Filter set to FLAT and PULSE.

⑥ Push the OVS/SRC button to select an oversampling HIGH or LOW, or the sample rate converter (SRC=UPS).

Different oversampling frequency settings allow the choice between high filtering with strongest signal preceding and more “quiet” sound (HIGH=128fs, 64fs or 32fs)\* down to low filter with small signal alteration and very “open” and “dynamic” sound by simplest filtering (LOW=32fs). Select the oversampling rate according to your listening preference.

\*Oversampling rate HIGH varies with the input signal’s sampling frequency. For detail refer to page 8 ⑥.

AES	FRONT	176K	192K
COAX	DF FLAT	88K	96K
TOS	<b>OVS HIGH</b>	44K	48K
USB	UPS	NO PCM	32K

When selecting SRC ON, UPS lights up in the display and oversampling rate is always set to LOW (32fs) but not displayed. In case of high jitter input signal SRC should be ON. In case of low jitter input signal SRC bypassed may result in better sound than SRC ON, due to less signal processing

AES	FRONT	176K	192K
COAX	DF FLAT	88K	96K
TOS	OVS HIGH	44K	48K
USB	<b>UPS</b>	NO PCM	32K

## Troubleshooting

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If you suspect a malfunction of the unit, please check the following chart before calling your dealer.

### **No power**

- Check the connection at the both ends of the AC power cord.
- Make sure there is power at the wall outlet.
- Check the power switch position.

### **No sound**

- Check the connection from the external source, e.g. CD player.
- Check the operation of the external source, e.g. CD player.
- Check the connection to the speakers or headphones.
- Check whether the matching input is selected.
- Check setting of VARIABLE / FIXED OUTPUT switch on backside.
- If VARIABLE OUTPUT is selected, check VOLUME position.

### **INPUT indicator continues blinking and no signal**

- Turn DA53N off and unplug the AC power cord from the outlet. Wait for a minute, plug the AC power cord back in and turn DA53N on again. Check if all plugs on the front and rear panel are properly connected.

### **Hum noise**

- Check if the plugs are connected correctly.

### **Distorted sound**

- Decrease the volume level.
- Check position of VARIABLE / FIXED OUTPUT switch on backside. This switch should never be pushed to the inside position, if a power amplifier or active speaker without volume control is connected.
- Check that all plugs are connected correctly.

### **Service Contact Preparations**

In case you need to contact the service center please prepare the following information:

- Model name and serial number
- Purchase date
- Dealer name and contact information
- Description of the unit's problem

## Specifications

DAC	Burr-Brown PCM1796 x 2
Inputs /	
Sampling frequency range	USB-1.1: 32-48kHz (Rear B-type) USB-1.1: 32-48kHz (Front mini B-type) AES/EBU (XLR): 32-192kHz COAX (RCA): 32-192kHz TOSLINK (Optical): 32-96kHz
Digital Filter	FLAT or PULSE selectable
Oversampling rate	LOW=32fs, HIGH=128fs (up to 48kHz input), 64fs (up to 96kHz) or 32fs (up to 192kHz)
Sample Rate Converter (=UPS)	24bit/96kHz, ON or OFF selectable
Frequency Response	20Hz – 20kHz, +0/-0.2dB (DF FLAT)
S/N Ratio	XLR -125dB, RCA -102dB (OVS LOW=32fs)
Analogue outputs (FIXED)	Balanced XLR (2=HOT) x 1: 4Vrms Unbalanced RCA x 1: 2Vrms
Analog outputs (VARIABLE)	Balanced XLR (2=HOT) x 1: max. 4Vrms Unbalanced RCA x 1: max. 2Vrms
Headphone output	6.3mm x 1, 16 – 300 Ohm
Headphone rated power	max. 1.8Vrms x 2 (100 Ohm) max. 1.5Vrms x 2 (32 Ohm)
AC power Line	AC100V - 240V, 50/60Hz
Power consumption	16W
Dimensions	Approx. 218(W) x 340(D) x 58(H) mm (Incl. knobs, terminals and legs)
Weight	approx. 2.5kg
Accessories	AC power cord, Owner's manual
Color	Silver
NOTE: Design and specifications are subject to change without notice.	
NOTE: Illustrations on the owner's manual may deviate from the actual unit due to design improvements.	



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**CEC Co., Ltd. Japan**  
<http://www.cec-web.co.jp>

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