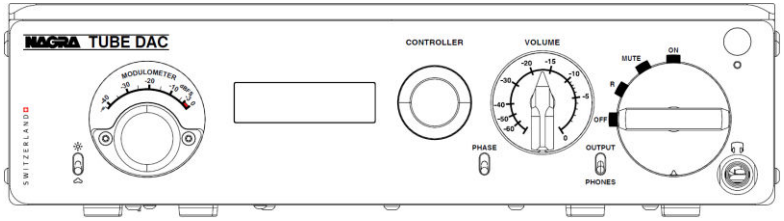
TUBE DAC – D/A converter



User manual

P/N: 2055111159

Safety warning

- Read this manual carefully before operating the TUBE DAC;
- Should you have any questions on how to setup or use your TUBE DAC, please contact your Nagra dealer;
- Audio Technology Switzerland SA declines any responsibility in the event of an accident caused by the non-observance of these instructions or any other form of user negligence;
- The TUBE DAC shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus;
- Never try to open your TUBE DAC when it is powered to prevent risk of electric shock and burn. Switch it OFF, switch off the external power supply and remove DC power cables from TUBE DAC back panel. Wait for 15 minutes before any intervention into your device, as tube exchange, or headphones amplifier level setting. If you are not sure what to do, please contact your Nagra dealer.

Warranty

Audio Technology Switzerland SA certifies that this device has been inspected and tested before leaving the factory.

Every Nagra unit goes through our test laboratory. The result of the measurements is recorded in the "Protocol" documentation that comes with your device.

We guarantee our products against all manufacturing defects, for a period of three years for the TUBE DAC and six months for the tube, running from the date of delivery to the customer (validated by the serial number on the device casing and the invoice from an official Nagra dealer). This warranty is only valid for the original purchaser of new equipment.

This limited warranty covers the repair and replacement of defective parts, excluding any other remedy.

The absence of a serial number invalidates the warranty.

We decline any responsibility for damages resulting directly or indirectly from the use of our products and from the use of any components or spare parts other than those designated as original/approved parts by Audio Technology Switzerland SA.

As we constantly strive to improve our products, we reserve the right to modify them or change their specifications without notice.

Congratulations

Congratulations! You have just acquired one of the best digital-to-analog converters ever built.

The TUBE DAC was created by an engineering team with more than 60 years' experience designing world-class products for the professional audio, national security and military businesses. The professional and Hi-Fi product ranges are designed by the same Research and Development department.

Nagra launched its Hi-Fi range to allow the wider public to benefit from technical advances that are often the privilege reserved for professionals. In so doing, the ultimate sonic excellence has been shared throughout the Hi-Fi range.

Ever since its creation in 1951, Nagra has been building devices that offer unparalleled performance, and the company has received many awards for its technical innovations and the excellence of its products over the years. Among the most prestigious, Nagra has been awarded three Oscars® and an Emmy®.

Our experience, precision and dedication to detail has been implemented to do service to music, your music. This is why we wish you many hours of listening pleasure and memorable moments enjoying your TUBE DAC.

Thank you for your trust.

Package contents

In addition to this User manual and the TUBE DAC itself, the box contains:

- A printed record of the exact measurements, response curve characteristics of your device, measured in the Nagra laboratory;
- A DAC IR Remote control unit (2 x AAA dry-cells inside);
- A pair of "Haute Horlogerie" grade microfiber gloves;
- An Allen key (Hex) driver to open the TUBE DAC (for dealer use preferably);
- An USB key with PC and MAC configuration information.

Please contact your Nagra dealer if anything is missing.

Installation

Positioning

In order to avoid risks of fire and electric shock, the TUBE DAC should be used exclusively indoors. It has been designed for a usage in moderate climate.

If possible, it is preferable not to place other HiFi elements on top of your TUBE DAC and free access to the ventilation holes, located under the device and on the top surface (above the tube), must be maintained at all times to allow sufficient natural cooling during operation.

The Nagra TUBE DAC must be placed on a stable horizontal surface. We strongly recommend the use of the special anti-vibration support plates, HD VFS, Vibration Free Supports, developed by Nagra. These consist of two solid aluminum isolated plates that use the same silicon base damping material as the Nagra CD mechanics. These plates will eliminate any mechanical vibrations that may interfere with the sonic excellence of your TUBE DAC.

Powering the TUBE DAC

The TUBE DAC has a unique powering system, with totally independent supply sources for the digital and analog portions of the electronics. This dual powering system was developed to eliminate any interference between the different elements and guarantee an uncompromising audio transparency.

Connecting to a Nagra MPS/CLASSIC PSU

The TUBE DAC will reveal its full potential with the full chassis power supply Nagra MPS or Nagra CLASSIC PSU which were specifically designed to provide several independent power sources for different Nagra Hi-Fi elements.

Connection
Verify that both TUBE DAC & MPS/CLASSIC PSU front selectors are in the **OFF** position. Insert the LEMO plug with **a black Ring (connector sleeve)** from both cables supplied with the MPS/CLASSIC PSU unit into two LEMO socket outputs on the backside of the MPS/CLASSIC PSU unit.
Then, insert the second LEMO plugs of cables into both LEMO socket inputs on the backside of the TUBE DAC by applying following recommendations:

- *For TUBE DAC:* The second side of LEMO cable can have either a black or another colour connector sleeve. It does not matter!

- *Only with MPS:* If available, we recommend using MPS output 1 for the TUBE DAC DC digital input and MPS output 2 for the TUBE DAC DC analog input (noise).

- *With MPS and CLASSIC PSU:* Always use the first available output of the power supply device for the TUBE DAC DC digital input and the consecutive one for the TUBE DAC DC analog input (sequential start of MPS/CLASSIC PSU outputs, it is better to first start digital section of TUBE DAC).

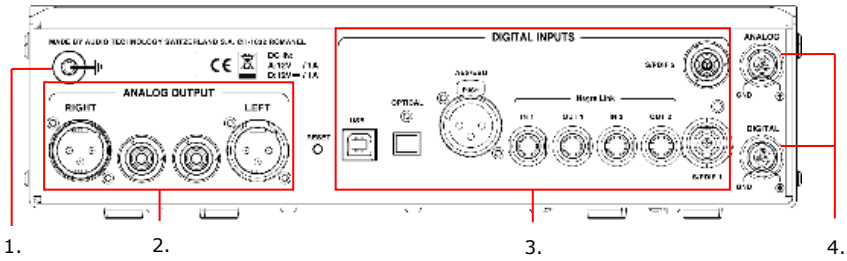
First start up power supply unit by turning front selector to **ON** position. Wait for the end of starting process (MPS: when the 4 output LEDs on front panel are switched ON, CLASSIC PSU: when the blinking LED on the right side of front panel switches OFF).

Now you can start up the TUBE DAC by selecting the desired position on front selector.

Disconnection
First, turn the TUBE DAC front selector to **OFF** and wait for its complete shutdown (when display and modulometer backlight switch OFF).
Then, turn the power supply unit front selector to **OFF** and wait for its complete shutdown (when LEDs and modulometer backlight switch OFF).
Now you can safely remove LEMO plugs from the TUBE DAC and MPS/CLASSIC PSU back panels:

Grip the fluted section of the plug, between thumb and index fingers as shown in the picture and pull the crown of the connector backwards.

Rear panel connection block



1. Ground connector (see note below)

2. The analog output section provides both RCA or XLR which should NOT be used simultaneously. The XLR outputs are unbalanced (asymmetrical). Should you need transformer balanced outputs, please contact your Nagra dealer.

3. Digital inputs section (from left to right):

   - The USB (UAC2*) connector is for receiving digital audio from a PC, a MAC computer, a NAS
   - TOSLINK is a standard optical data connection
   - AES / EBU XLR input conforming to the AES-3 standard
   - Four optical Nagra links
   - Two S/PDIF inputs, 1 on BNC, 1 on RCA

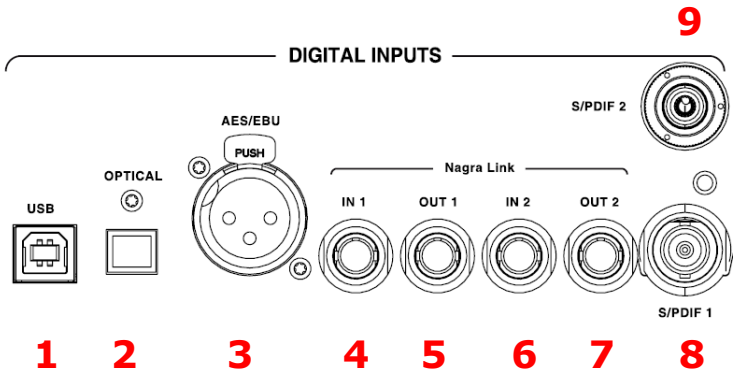
4. DC power inputs

   - Analog, powers the TUBE DAC analog section
   - Digital, powers the TUBE DAC digital section

*UAC2 stands for "USB Audio Class 2" works to connect computers PC or Mac as well as other computer type devices.

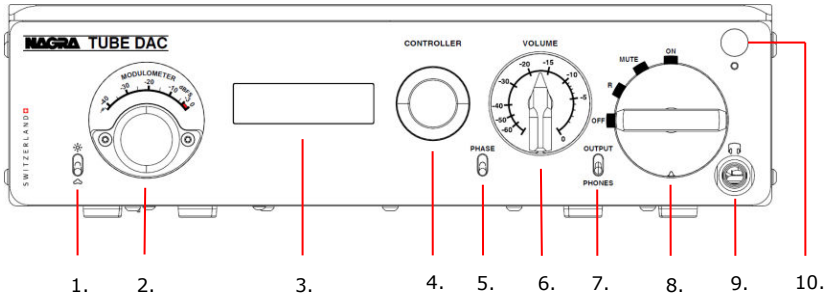
Note about the Ground connector
This connection is seldom used but may solve specific setup issues concerning "hum". Your Nagra dealer will assist you on when and how to use this connector.

Audio inputs



	Input type	Input format
1:	USB B-type	DSD: up to DSD256 (DSD4x) PCM: up to PCM 384kHz
2:	TOSLINK EIAJ optical (MM fiber)	PCM: up to PCM 192kHz
3:	AES/EBU	PCM: up to PCM 192kHz
4-7:	ST (MM fiber)	DSD: up to DSD256 (DSD4x) PCM: up to PCM 384kHz
8:	S/PDIF 1 BNC	PCM: up to PCM 192kHz
9:	S/PDIF 2 RCA	PCM: up to PCM 192kHz

Front panel



1. This switch adjusts the intensity of the Modulometer back-light and the main display. Pushed up increases the intensity, while down will reduce it, there are 7 levels of intensity.
2. Nagra Modulometer indicates the digital input level in dB FS (Full Scale) of the currently selected input. 0 dB being the maximum level. The black needle corresponds to the signal on the left channel and the red needle to that of the right channel.
3. Dual line LCD display for operating mode and menu display.
4. Controller knob, which has several features, described below.
5. PHASE switch.
6. Volume adjustment potentiometer.
7. This switch selects the routing of the analog outputs: **OUTPUT** is for the line (RCA or XLR) output, **PHONES** for headphones jack.
8. The front selector is the principal activation switch for TUBE DAC. In the **OFF** position the TUBE DAC is in "Standby" mode*.
9. Headphones output jack.
10. Infra Red sensor window for the remote control, and its activation LED

*In standby mode the power consumption is less than 100 mW.

Please note that when turned **ON**, the TUBE DAC will go through a 2 minute pre-heating phase. This is in order to optimize the warming-up of tubes and critical components. This will allow your TUBE DAC to offer excellent performance for a longer period, by managing the critical components gently.

HEADPHONES OUTPUT
This equipment is capable of producing high sound levels which can be harmful to your hearing

Setting your TUBE DAC

Using the rotary controller knob along with the display, your TUBE DAC can be personalized to integrate it into your system. Please take a moment to learn more about the settings that you can change to enjoy your music even better.

The controller knob

The controller knob can be rotated or pressed to access different functions of your TUBE DAC.

Accessing the menu mode

All menu related features are managed using the controller knob, which can be rotated or pressed.

Press and hold the Controller knob for 2 seconds to access the menus.

You can navigate within the menu tree through the different topics by rotating the Controller. To exit the menus, press the Controller knob for 2 s.

How to operate the Controller knob

Controller	Normal operation	Inside menus
Press and hold (2 s)	Access menus	Exit menu (1 step up)
Rotate	Change input	Scroll up or down
Press once (briefly)		Go forward / validate

We suggest you to navigate inside the menus to get familiar with the navigation controller, then you can start setting-up the various possibilities.

Menu tree or map

Below is the menu tree or map, that will help you localizing the function you are looking for. It may look complex, but actually once you have set-up your TUBE DAC, you won't need to change it often or at all! Explanations how to modify the selections are given below.

--- LANGUAGE ---	ENGLISH	
	FRANCAIS	
	DEUTSCH	
	ESPAÑOL	
	ITALIANO	
- INPUT NAMES --	AES	
	S/PDIF 1	
	S/PDIF 2	
	NLINK1	
	NLINK2	
	OPTICAL	
	USB	
	DEFAULT NAMES	
INPUT ASSIGNMENT	AES to USB (for every input)	DISABLED
		REMOTE BUTTON A
		REMOTE BUTTON B
		REMOTE BUTTON C
		REMOTE BUTTON D
		REMOTE BUTTON E
		REMOTE BUTTON F
		NO REMOTE BUTTON
		DEFAULT ASSIGN.
AUDIO SETTINGS	-- LINE LEVEL --	LOW
		HIGH
	-- LINE MODE ---	DIRECT
		VARIABLE
	- OUTPUT PHASE -	NORMAL
		REVERSE
	-- USB POWER ---	ALWAYS ON
		IF INPUT ACTIVE

---- REMOTE ----	RC-5	
	DEVICE 1	
	DEVICE 2	
	DEVICE 3	
	DEVICE 4	
	DEVICE 5	
	DEVICE 6	
---- ABOUT -----	SOFTWARE VERSION	
	OPERATION TIME	
	TUBE TIME	
	SERIAL NUMBER	
	DAC INFO	

Setting the language

You might want to start by setting the language!

First, press and hold the Controller knob for 2 seconds to enter the menu mode and the following display will be shown.

Press the Controller knob briefly, then the currently selected language will start to flash. Rotate the Controller knob to select the desired language and press the Controller knob once more to store the desired selection.

Naming of the digital inputs

Each of the digital inputs of the TUBE DAC can be named by the user to identify different sources easily. 10 characters are available to name each of your digital inputs. Each name can include letters, numbers and special characters, which are presented in the following order:

A…Z a…z _-*#/,.:;0123456789

First, press and hold the Controller knob for 2 seconds to enter the menu mode, then turn the controller until the following display is shown:

Press the Controller knob to enter into this menu.

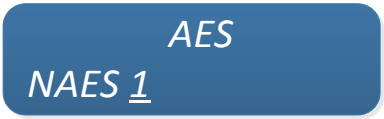
AES is the first digital input (factory setting) in the list, rotate the Controller knob until the desired input to be named is on the display and press the Controller knob once more.

An underscore "_" will appear beneath the first character of the current name (as shown) and rotating the Controller knob will scroll through the available characters. Each consecutive press of the Controller knob will move to the next character. Once the entire name is complete, press the Controller knob until the cursor (underscore) disappears from the display. The new name will now be stored and displayed for the desired input.

Example:

Press the Controller knob once, you see a "_" under the A.

Rotate the Controller knob clock-wise, the letters are changing. To select a given character, press the Controller button once (short time).



You may also insert a space. A space is considered as a character (space is the last character of the list, after 9).

The max length for the name is 10 characters

Press one more time on Controller knob to remove the cursor from display. Now the selected name is stored.

Same procedure if your selected name is smaller than 10 characters. Briefly press enough times on Controller knob to reach the 10th character position and one more time as above to remove the cursor from display. The selected name is stored.

Reset of input names

If you are unhappy with the names you have chosen, you can reset all the input names to "Factory Settings".

Go into the INPUT NAMES menu, scroll to the last one:

Press the Controller knob 2 s and all input names are reset to factory setting.

Input assignment

The TUBE DAC features a wide array of inputs. You may not need all of them. To make input selection easier, you can decide which input you want to be active, and on which IR remote control key it will be accessible. In the Menu, go to "INPUT ASSIGNEMENT":

Press the Controller knob to display first input and its currently selected option.

Rotating the Controller knob will scroll through the list of inputs.

Press on the Controller knob and the current option becomes blinking. Then rotate the Controller knob to change the option for the selected input.

For each input, you can select the following:

DISABLED — The input is deactivated (the input is not displayed any longer in main menu where you select the working input).

REMOTE BUTTON A to F — Allocate the IR remote control key active for the selected input.

NO REMOTE BUTTON — The input is active, but does not have an IR remote control key assigned to it. However, you can select it using the Controller knob in main menu where you select the working input or with "-" and "+" input selection keys on IR remote control unit.

After selecting the desired option, press once on the Controller knob, the selected option stops blinking, the selection is stored.

If you wish to return to the factory settings of the input assignment, go to "INPUT ASSIGNEMENT" menu:

Press the Controller knob to display the first input and its currently selected option.

Rotate the Controller knob to the last position of input list.

Press 2 s on the Controller knob and all input assignments are reset to factory setting.

Audio settings

Line level
In order to match levels with your preamplifier or your power amplifier, the TUBE DAC features two selectable output levels. For a 0 dBFS (maximum level) you may select either LOW (1.3 V_{RMS}) or HIGH (2 V_{RMS}) as your analog output level.

To change the level, go to:

Press the Controller knob to display the first parameter and its currently selected level.

This is the state the TUBE DAC is currently set.

To change the level, press the Controller knob and select LOW or HIGH by rotating it, then confirm by pressing once again the Controller knob, the new desired LINE LEVEL is stored.

Line mode
The TUBE DAC can operate as a pure D/A converter connected to an external preamplifier or an integrated amplifier that both possess their own volume control. In this case, you should have a fixed output level: DIRECT (the signal won't pass through the TUBE DAC potentiometer, and no control is possible).
Should you wish to use the TUBE DAC built-in volume control, you should select a tunable output level: VARIABLE.

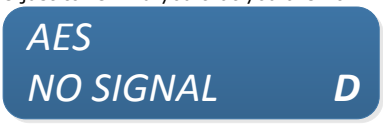
You may select DIRECT or VARIABLE, it will not affect the headphones amplifier level, the latter will always go through the volume control potentiometer allowing the playback level to be adjusted. To select the mode, go to:

Press the Controller knob to enter into the AUDIO SETTINGS menu and rotate it to select LINE MODE.

By default, VARIABLE is selected, as shown here.

To change the mode, press the Controller knob and select VARIABLE or DIRECT by rotating it, then confirm by pressing once again the Controller knob, the new desired LINE MODE is stored.

Note
When you change the setting from VARIABLE to DIRECT, the TUBE DAC will be muted, a blinking **D** will appear on the right down corner of main display. This is just to remind you that you are now in DIRECT mode, the signal will be at full level. If you have changed this setting by accident, there is time to come back to VARIABLE before damaging your hearing or your speakers!



When you change the setting from DIRECT to VARIABLE, the TUBE DAC will be muted, a blinking **X** will appear on the right down corner of main display. This is just to remind you that you are now in VARIABLE mode, the signal level will be adjustable with volume control potentiometer.

If the optional symmetrical output transformers are installed into your TUBE DAC, the VARIABLE mode does not work any longer.

WARNING

With DIRECT line mode selected:
- Before 1.03 software version, at power ON, audio output is muted.
- Since 1.03 software version, at power ON, audio output is NOT muted any longer. Be careful with audio output level not to damage your hearing or your loudspeakers!

Absolute phase
You can change the absolute phase at any time while listening by pushing the PHASE switch on front panel upward to invert the phase or downward to remove the inversion.

A Phi symbol will appear on the right top corner of the main display when inverted mode is active.

You may also define the default phase inside the AUDIO SETTINGS menu:

Press the Controller knob to enter into the AUDIO SETTINGS menu and rotate it to select OUTPUT PHASE.

By default, NORMAL is selected, as shown here.

To change the phase, press the Controller knob and select NORMAL or REVERSE by rotating it, then confirm by pressing once again the Controller knob, the new desired OUTPUT PHASE is stored.

USB power
When using the USB input, a significant amount of power is dedicated to specific USB circuits. If you don't use the USB input, you can de-activate the USB circuits. This way you can save power consumption and avoid powering unnecessary components.

To select the mode, go to:

Press the Controller knob to enter into the AUDIO SETTINGS menu and rotate it to select USB POWER.

By default, ALWAYS ON is selected, as shown here.

To change the setting, press the Controller knob and select ALWAYS ON or IF INPUT ACTIVE by rotating it, then confirm by pressing once again the Controller knob, the new desired USB POWER setting is stored.

Note
IF INPUT ACTIVE is set, the computer will only see the TUBE DAC when USB input is selected.
If USB ALWAYS ON is set, the computer will always see the TUBE DAC.

Remote

You can select here RC-5 encoding format if using the IR Remote Control Unit delivered with your TUBE DAC or another universal IR Remote Control Unit that uses the same RC-5 format (see page 30 for more details). It is also possible to work with another IR Remote Control Unit using RECS-80 format as Nagra RCU II. In this case you will choose the IR Remote Control Unit key allocated to your TUBE DAC (6 different keys are available).

To select the mode, go to:

Press the Controller knob to enter into the REMOTE menu.

By default, RC-5 is selected, as shown here.

To change the setting, rotate the Controller knob and select RC-5 or DEVICE y (y = 1 to 6), then confirm by pressing once again the Controller knob, the new desired setting is stored.

About

ABOUT menu provides you useful information about your TUBE DAC:

Press the Controller knob to display the first parameter and its current value. Then rotate the Controller knob to scroll the parameter list.

SOFTWARE VERSION

The current software version loaded in your TUBE DAC. Should we release a new software version, we will advise your dealer and it will be available on our website.

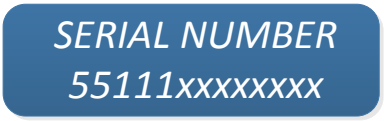
OPERATION TIME

This counter will let you know how many hours the TUBE DAC has been powered on. This counter can not be reset.

TUBE TIME

This counter will let you know how many hours the tube has been powered for. Whenever you change the tube, you can reset it. Normally the internal tube of the TUBE DAC should last for a minimum of 5'000 hours of normal operation. To reset the counter, press the Controller button to get confirmation message.

Then press the Controller knob a second time to reset the counter. To exit without resetting the counter, press the Controller knob for 2 s.



SERIAL NUMBER

The 13-characters serial number can not be changed or erased. Should your TUBE DAC be stolen, please send us your serial number and we will track this unit if it ever reaches a Nagra dealer or a service center.

DAC INFO

This information is for Nagra servicing, it displays the D/A board software version.

USB set-up with computers

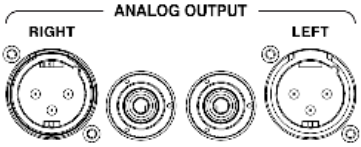
Due to the rapidly changing nature of the computer world, all computer related set-up information is to be found on the supplied USB key.

MAC
The Nagra TUBE DAC is recognized as a playback device, no further software is required. Simply select the Nagra TUBE DAC device in the audio settings menu.

PC
You will need to install a driver and update your ASIO drivers as well; the drivers are to be found on the USB key supplied with your Nagra TUBE DAC.

More information on inputs and formats
The TUBE DAC comes with 7 different digital inputs. Please find the format compatibility in the above "AUDIO INPUTS" section.

Connecting the TUBE DAC to your system



You may use either RCA or XLR connectors to connect your TUBE DAC to your preamplifier or amplifier.

Do not use both outputs in parallel.

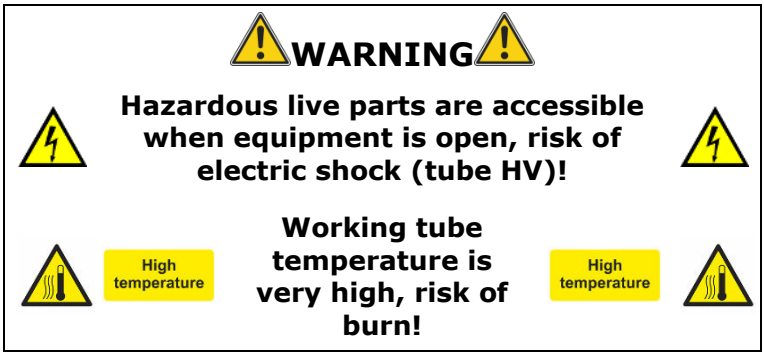
XLR outputs are unbalanced, should you require balanced (symmetrical) outputs, optional transformers can be custom built for you. Please contact your Nagra dealer to know more about this option.

It is strongly recommended to use high quality cables throughout your system to benefit from the exceptional audio quality available.

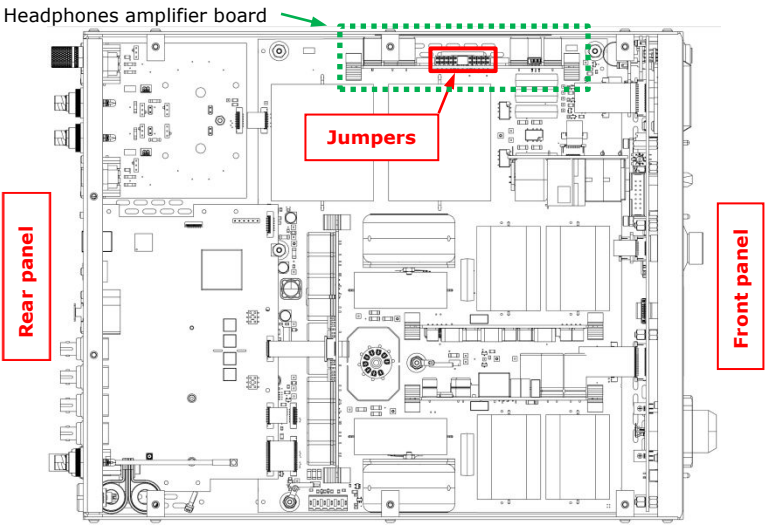
Setting the headphones amplifier level

The headphones amplifier output level can be adjusted, by the means of jumpers, to match the sensitivity of your headset.

The settings to change your headphone amplifier are inside the TUBE DAC so your dealer should adjust it upon delivering of the unit.

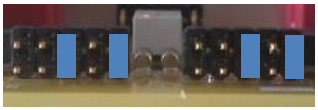


Turn the TUBE DAC front selector to **OFF**, switch off the external power supply and unplug DC power cables from TUBE DAC back panel. Wait for 15 minutes before any intervention into your device. If you are not sure what to do, please contact your Nagra dealer.



The headphones amplifier board is located on the right side of TUBE DAC, with two series of jumpers for settings as explained below:

No attenuation (factory setting)



6 dB attenuation (-6 dB)

Limited power output

Note

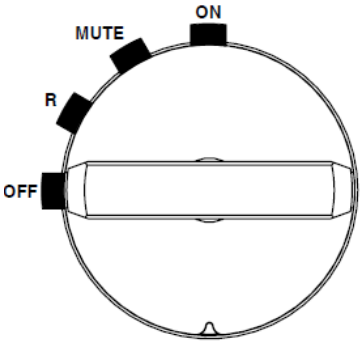
When listening through headphones, the perceive level is always lower than the actual level. If you are in any doubt, please use the "Limited power output" setting. Also be careful of possible high level differences, when switching from the external output to the headphones output and vice versa.

HEADPHONES OUTPUT

This equipment is capable of producing high sound levels which can be harmful to your hearing

Operating your TUBE DAC

Front selector



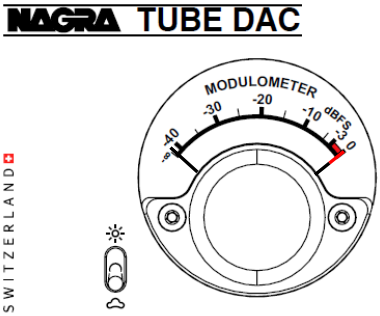
OFF Similar to STANDBY, the unit is still powered but the consumption remains very low (IR remote control unit is not active)

R The device is fully controlled by IR remote control unit

MUTE The unit is ON but outputs are muted (It can not be unmuted by IR remote control unit)

ON The unit is ON and can not be switched off by IR remote control unit

Nagra Modulometer



The Modulometer, or "modulation meter", was inherited from the second professional recorder developed by Nagra back in 1952, the Nagra II.

The Modulometer is a typical Nagra precision instrument that displays the necessary information to make the best possible recordings.

In the case of the TUBE DAC, the Modulometer displays the digital input level. The 0 dB corresponds to full scale signal, meaning the maximum digital level.

The modulometer, in the TUBE DAC, is a twin pointer digitally controlled instrument:

Left channel - black needle
Right channel - red needle

Modulometer & display intensity adjustment

This toggle switch allows you to adjust the Modulometer & display backlight intensities. Pushing the toggle switch up will increase the intensity, pushing it down will lower the intensity all the way to complete extinction. There are 7 different intensity levels.

Phase mode selection

PHASE

The outputs of the TUBE DAC can be set to phase inversion mode when you activate the PHASE switch. Pulling up the toggle switch will activate the phase inversion. Pulling it down will deactivate the phase inversion.

Headphones output selection

OUTPUT

PHONES

To activate the headphones output, pull down the two-way switch to PHONES position. Pull it up to activate the output connectors located on TUBE DAC back panel.

HEADPHONES OUTPUT

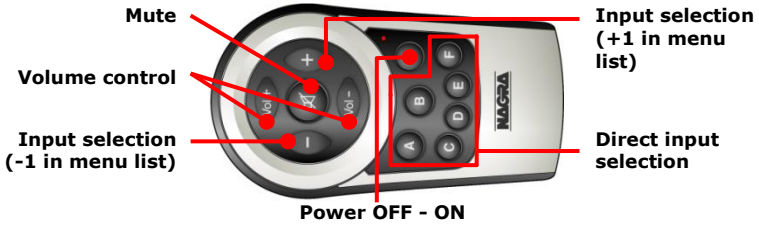
This equipment is capable of producing high sound levels which can be harmful to your hearing

Please, turn the volume level control to the minimum before pulling down the selection switch to activate jack output and before connecting your headphones

IR remote control unit

The remote control unit, with batteries installed, shall not be exposed to excessive heat such as sunshine, fire or the like.

The TUBE DAC currently comes with the RCU-III IR remote control unit with Philips RC-5 format encoding. You may also use Nagra RCU or RCU-II IR remote control unit. Make the necessary setting into REMOTE menu.



Direct input selection (factory setting, but you can inactivate or reorder inputs in INPUT ASSIGNMENT menu)

A	AES	**D**	N-LINK 1
B	S/PDIF 1	**E**	N-LINK 2
C	S/PDIF 2	**F**	OPTICAL

There is no direct selection key to USB input. Use "+" key to select it.

Input selection with "-" and "+" keys

Press on "-" key to select one input before current input selection in menu list.
Press on "+" key to select one input after current input selection in menu list.

Power OFF - ON key

Toggle key to switch OFF and ON the TUBE DAC. When switching ON, the TUBE DAC automatically select the last input active before last power OFF.
Note: *This key is only operative when front selector is turned to R position!*

Battery installation/exchange

Open the battery drawer by removing the screw located on the back side of remote control unit with a small Phillips drive screwdriver.

Replace empty batteries with either 2x new AAA-Dry cell battery or 2x AAA-NiMH/NiCd rechargeable battery externally loaded.

By ensuring battery is disposed of correctly, you will help prevent potential negative consequences for the environment and human health. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of battery, please contact your local authority, your household waste disposal service or the shop where you purchased the battery.

Use of an universal IR remote control unit

The TUBE DAC responds to IR (Infra Red) signals coded in Philips RC-5 format. A default code 19 has been allocated to TUBE DAC as a Digital-to-Analog converter.

Should you wish to program your universal remote control, please use the following table:

Code	Function
1 to 7	AES to USB inputs
32 & 33	Input change step-up or step-down
16	Volume Up
17	Volume Down
13	Mute
12	Power OFF - ON

TUBE DAC channel selection

Factory settings
The TUBE DAC is factory set to the Philips RC-5 format encoding.

Changing device number
If you wish to use a specific device number for your TUBE DAC (for instance on a RCU-II), select the desired DEVICE number (DEVICE 1 to DEVICE 6) into REMOTE menu (REMOTE paragraph in SETTING YOUR TUBE DAC section).

Burn-in period

In order to obtain optimal performance from the Nagra TUBE DAC, it is preferable to leave the device switched on for about 15 minutes before use, so that the internal components can reach their optimum operating temperature.

Like all tube electronic devices, the Nagra TUBE DAC needs a running-in period. It will reach peak performance after a few hundred hours operation.

Tube ageing

Please check in the menu to see how many hours your tube has been operating.

The TUBE DAC tube is a high grade military tube selected by Nagra according to exacting criteria. Their theoretical minimum useful life is 5000 hours. Actually, some tubes operate consistently for more than 10 000 hours.

Thus, the useful life of the tubes is somewhat unpredictable. Rather than replacing the tubes arbitrarily after 5000 hours, we suggest that you identify the signs of ageing:

- The distortion gently increases to an audible level;
- Presence of clicks (dry and short noise, like breaking dead wood);
- Presence of pops, short noise in the low frequencies;
- Presence of hiss, higher background noise;
- Reduction of spaciousness, loss of naturalness.

As soon as one of these signs appears, please contact your Nagra dealer to order a TUBE DAC replacement tube kit, reference 7055761000.

Case cleaning

Clean the TUBE DAC casing using a soft, non-fluffy, slightly damp cloth. Do not use any cleaning products which could have a corrosive effect.

Technical specifications

Below are the typical specifications for the Nagra TUBE DAC.
Your own specific TUBE DAC's exact specifications are to be found on the "protocol" delivered with your unit.

Digital inputs	1x AES/EBU, 2x S/PDIF, 2x NAGRA-LINK, 1x Optical, 1x Audio USB (UCA2)	
Analog outputs	1 stereo RCA 1 stereo XLR	Symmetrical on optional transformers
Output level	1.3 or 2 V_{RMS}	
Analog output Noise level	-128 dBr @ 1 kHz 1.3 V	linear
Distortion	< 0.02 %	@ -20 dBFS
THD + N	< 0.03 %	@ 192 kHz
Frequency Response	5 Hz - 40 kHz	+0 / -1 dB
Crosstalk	99 dB	
Inter-channel phase	<0.1 °	@ 20 kHz
Power supply	2x 12 V⎓ /1 A	External Nagra power supply (1x MPS or 1x CLASSIC PSU)
Power consumption	max 24 W	
Operating temperature	+15 °C to +35 °C +59 °F to +95 °F	Moderate climate
Operating environment	Indoor only	IP30
Dimensions	280 x 350 x 76 mm	12 x 13,7 x 3 inches
Weight	5 kg / 11 lbs	Without power supplies
Specifications may change without notice		

Declaration of conformity

EU declaration of conformity

Apparatus model / Product	Nagra TUBE DAC/Nagra HD DAC UPGRADE
Type / Batch / Serial number	805511100x / 7055110100

Company name	AUDIO TECHNOLOGY SWITZERLAND SA
Postal address	Chemin de l'Orio 30A
Postcode & city	1032 ROMANEL-SUR-LAUSANNE
Country	SWITZERLAND
Phone number	+41 21 643 72 40
E-mail address	info@nagraaudio.com

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object of the declaration (identification of apparatus allowing traceability; it may include a color image of sufficient clarity where necessary for the identification of the apparatus):

The Nagra TUBE DAC is a 2-channel audio Digital-To-Analog converter with two +12VDC power supply inputs.

The Nagra HD DAC UPGRADE is an upgraded HD DAC 2-channel audio Digital-To-Analog converter with two +12VDC power supply inputs and exactly the same electronic architecture than the Nagra TUBE DAC.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

☑ EMC Directive 2014/30/EU	☑ Low Voltage Directive 2014/35/EU	☑ RoHS 2 Directive 2011/65/EU + C.D. Directive (EU) 2015/863
☐	☐	☐

References to the relevant harmonised standards used, including the date of the standard, or references to the other technical specifications, including the date of the specification, in relation to which conformity is declared:

EN 55032:2015/AC:2016	EN 60065:2014+COR1:2015+COR2:2016+A11:2017
EN 61000-4-2	
EN 61000-4-3	
EN 61000-4-4 level 1 (500V)	
EN 61000-4-4 level 2 (1000V)	
EN 61000-4-5 level 2 (1000V)	

The notified body (where applicable) : Number

performed:

and issued the certificate.

Signed for and on behalf of:

Romanel	2019/03/28	T. Frank / R&D Manager
Place of issue	Date of issue	Name / Function / Signature

Disposal of old electrical & electronic equipment (Applicable in the European Union and other European countries with separate collection systems).

This symbol on the product or on its packaging indicates that this handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local authority, your household waste disposal service or the shop where you purchased the product.

Applicable to the following devices:
TUBE DAC and all the package content