Owner´s manual

TDAI 2200

LYNGDORF

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Manual version 02-07-07

Operating Voltage

The TDAI 2200 is available in two versions: one for 115V mains voltage and another for 230V mains voltage.

Check the label on the TDAI 2200 rear panel and verify you have the version with the proper voltage for your area.
The 115V version requires a mains voltage of 110V-120V at 50-60Hz with a current rating of 8A.
The 230V version requires a mains voltage of 220V-240V at 50-60Hz with a current rating of 4A.
The mains voltage setting for your TDAI 2200 can be changed ONLY BY A QUALIFIED ENGINEER.

	Connect the power input only to the AC source printed on the label. The warranty will not cover any damage caused by connecting to the wrong type of AC mains.

The TDAI 2200 has three power modes:
1. OFF

No circuitry is powered.

2. STANDBY

The mains transformer and amplifier section are powered off - only the remote control input and the microprocessor is powered, so the unit can be powered up using the remote control 'STANDBY' button.

3. ON

All circuits active.

Unpacking the TDAI 2200

Carefully remove the unit and accessory kit from the carton, visually check for shipping damage.
Contact both the shipper and your Lyngdorf Audio representative immediately if the unit bears any sign of damage from mishandeling. All Lyngdorf Audio equipment is carefully inspected before leaving our factory.

	Keep shipping carton and packing material for future use or in the unlikely event that the unit needs servicing. If this unit is shipped without the original packing, damage could occur and void the warranty.

Serial Number Registration

Please record the serial number of your amplifier here for future reference. The serial number is printed on the label on the TDAI 2200 rear panel. You will need this serial number, should you ever require service for your TDAI 2200 amplifier.

TDAI 2200 serial number: _____

Introduction

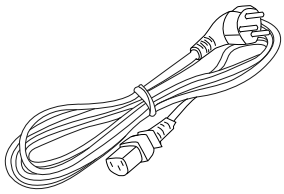
Congratulations on your investment in the Lyngdorf Audio TDAI 2200.

The TDAI 2200 is more than just a very good high-end amplifier, one that's exceptionally pure and natural sounding with even the most 'demanding' speaker loads. It also happens to be a completely unique Digital Control Centre.

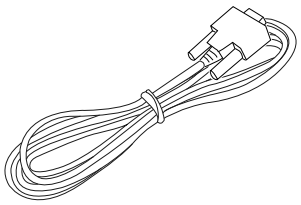
In fact we believe it to be the most versatile amplifier on the market today, a true state-of-the-art device that sets new standards for what's sonically possible to achieve in a real life environment.

Accessories

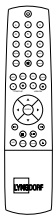
You should find the following accessories included:



Mains cord

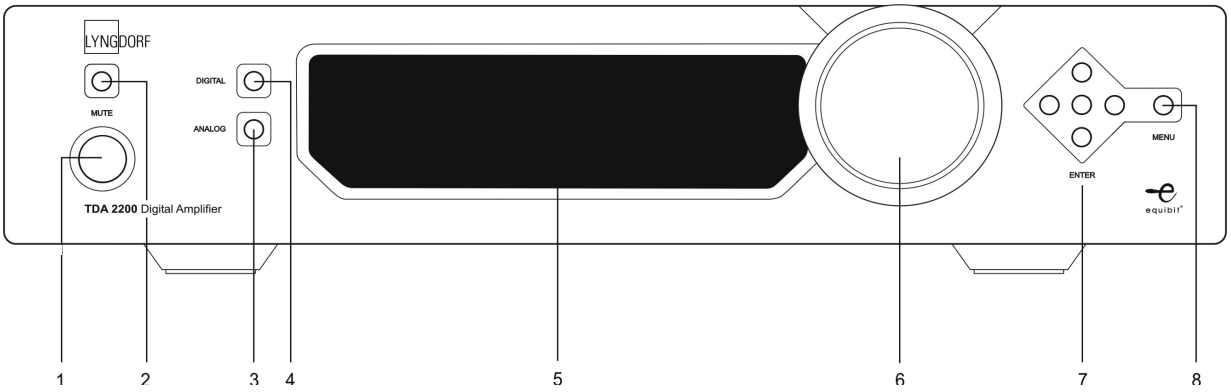


Programming cable



Remote control

Front Panel



Controls

The buttons/controls on the front panel of the TDAI 2200 can all be operated either with direct presses or by operating the corresponding keys on the supplied remote control. All the keys on the front panel [except the Mains switch (1)] are duplicated on the remote control as well.

1. Mains switch

Powers the TDAI 2200 on/off.
Stand-by mode is selected by pressing the mute button (2) for 3 seconds or with the stand-by button on the remote control.

2. Mute

Toggles Mute mode on/off.
Pressing the Mute button for 3 seconds will set the TDAI 2200 in stand-by mode.

3. Analog Input selector

Changes to Analog input, or if already selected, cycles to the next Analog input.
Switches the TDAI 2200 on from stand-by mode.

4. Digital Input selector

Changes to Digital input, or if already selected, cycles to the next Digital input.
Switches the TDAI 2200 on from stand-by mode.

5. Display

Display with all information on menu system, status, active input selection and volume control.

6. Volume wheel

Optical encoded volume control wheel

7. Navigation keys

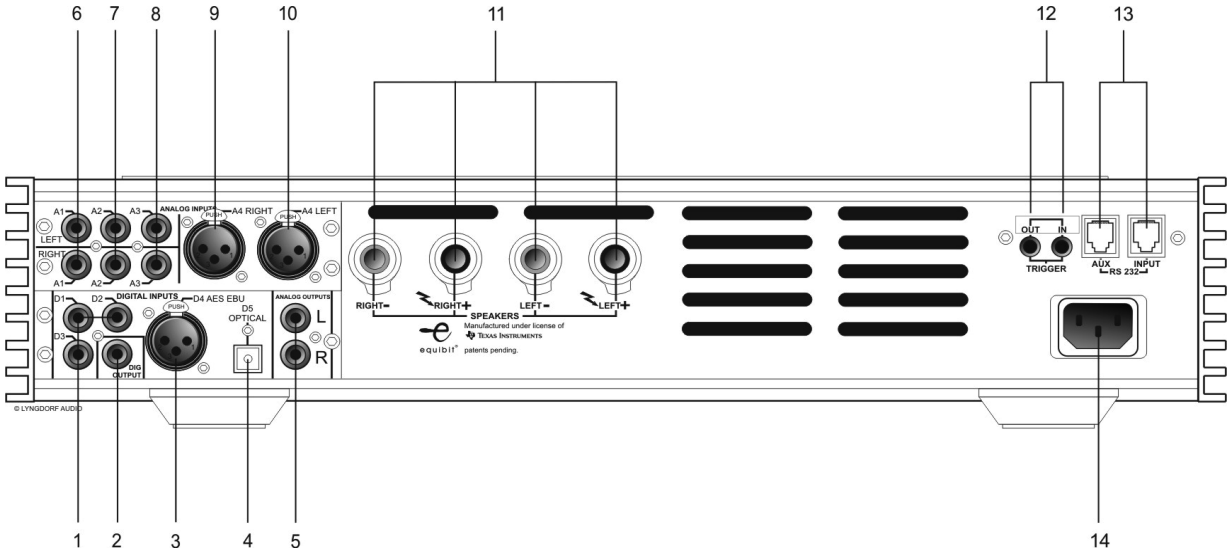
In normal operation mode the Left/Right toggles between DSP presets.
In menu mode used for navigation in the menu system: Up/Down, Left/Right & Enter.

	As default there are no DSP presets installed in the TDAI 2200, these must be defined by you. Please check the 'Support' section on the Lyngdorf Audio website for a desription of how to make DSP presets.

8. Menu button

Toggles Menu mode on/off

Rear Panel



1. Digital Input 1-3
RCA connectors for SPDIF input

2. Digital Output
Selected digital input is sent – full range or filtered via the DSP - to the Digital Output connector for daisy-chaining more than one TDAI 2200. The sample rate is fixed at 96 kHz. This output is also active when Analog input is selected.

3. Digital input 4
XLR Connector for AES input

4. Optical Digital input 5
Connector for Toslink input

5. Analog output
DAC output from DSP Section

6-8. Input
Single-ended Analog input L/R pairs 1-3

9-10. Input
Balanced Analog input L/R number 4

	The connectors from 6-10 are only available if the optional AD-Converter module is mounted.

11. Loudspeaker terminals
Loudspeaker output.

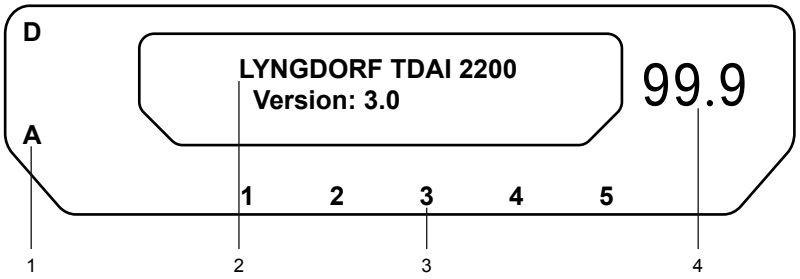
	All Outputs are bridged and must never be connected to ground because of the DC offset to chassis

12. Trigger Out / In
DC Trigger Out for remote start of SDA 2175 power amplifiers or similar equipment.
Trigger In has no function.

13. RS232 Input/Aux
RS232 communication connectors for communication with a PC, remote control from Lyngdorf equipment with broadcast commands or linked control between amplifiers. Input is looped to Aux out for daisy-chaining of amplifiers. The 'INPUT' is used for connection to a PC for software update, or as a control input from a Lyngdorf Master Amplifier. The 'AUX' connection is output in Master mode for controlling slave amplifiers, or bypasses input from other master amplifiers to the next amplifier.

14. Mains Input

Display Indicators



1. A-D
Illuminates to show whether the active input is Analog or Digital.

2. Menu
Alphanumeric Display (2*20 Characters).

3. 1-5
Illuminates the active input.

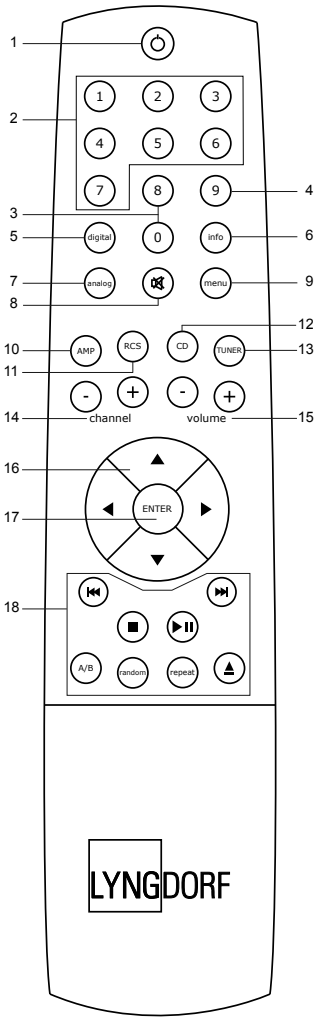
4. Volume Display
3 digits indicating Volume control setting from 00.0 to 99.9 – in dB's.
Mute is indicated by the Volume control setting '---'.

1-4. Power
Power on is indicated with display showing all information on status and volume control, Standby mode is indicated with the decimal dot from the volume control being lit only.

Remote Control

The remote control is used to access the menu system and replicate the buttons directly accessible on the front panel. To control the TDAI 2200 the AMP key should be pressed [please note the amplifier's volume and mute buttons still work when in CD mode].

The functionality of the buttons when AMP is pressed are as follows:



1. Standby

The standby button puts the TDAI 2200 in stand-by mode.

2. Numerical buttons 1-7

Select DSP settings.

3. Numerical button 8 and 0

Selects DSP bypass mode.

4. No function

5. Digital

Turns On the TDAI 2200 from stand-by mode in the last selected digital input.

Selects Digital input, or if already selected, cycles to the next Digital input. To select a specific Digital input, press the 'Digital' button followed by numerical button 1-5 within 2 seconds.

6. Info

Hold down for 2 seconds to show the current samplerate.

To select a specific Voicing filter, press the 'Info' followed by numerical button 0-6 within 2 seconds.

7. Analog

Turns On theTDAI 2200 from stand-by mode with the last selected analog input.

Selects Analog input, or if already selected, cycles to the next Analog input. To select a specific Analog input, press the 'Analog' button followed by numerical button 1-4 within 2 seconds.

8. Mute

Toggles Mute function on/off.

9. Menu

Activates or de-activates the Menu system on the Main display.

10. AMP

Selects the remote for operation with a Lyngdorf Amplifier.

11. RCS

Selects the remote for operation with a Lyngdorf Room Processor.

12. CD

Selects the remote for operation with a Lyngdorf CD Player.

13. Tuner
No function.

14. Channel -/+
Toggles down/up between inputs.

15. Volume Up/down
Changes volume in the chosen direction.

16. Up / Down / Left / Right
In normal operation mode the Left/Right toggles between DSP presets.
In menu mode they are used for navigation in the menu system. Pressing and holding down a key changes selected values fast.

	As default there are no DSP presets installed in the TDAI 2200, these must be defined by you. Please check the 'Support' section on the Lyngdorf Audio website for a desription of how to make DSP presets.

17. Enter
Turns the TDAI 2200 On from stand-by mode with the last selected input and works as Enter in menu system.

18. No function.

Menu System

The Main Display on the front panel of the TDAI 2200 shows all functionality and current status of the TDAI 2200. An overview of the menu tree can be seen in the 'Menu Tree' chapter.
When the amplifier is powered up the Main screen shows the product name and current software version.

After showing the initial screen the main screen is shown. Here the current Input, DSP Preset and Sample Frequency is displayed. Input name can be changed in the 'Input Name' menu, for DSP presets please refeer to the 'Support' section on the Lyngdorf Audio website. If a digital input is active the source samplerate is detected and displayed, if the Analog input board is mounted and selected the ADC samplerate 96 kHz will be displayed.

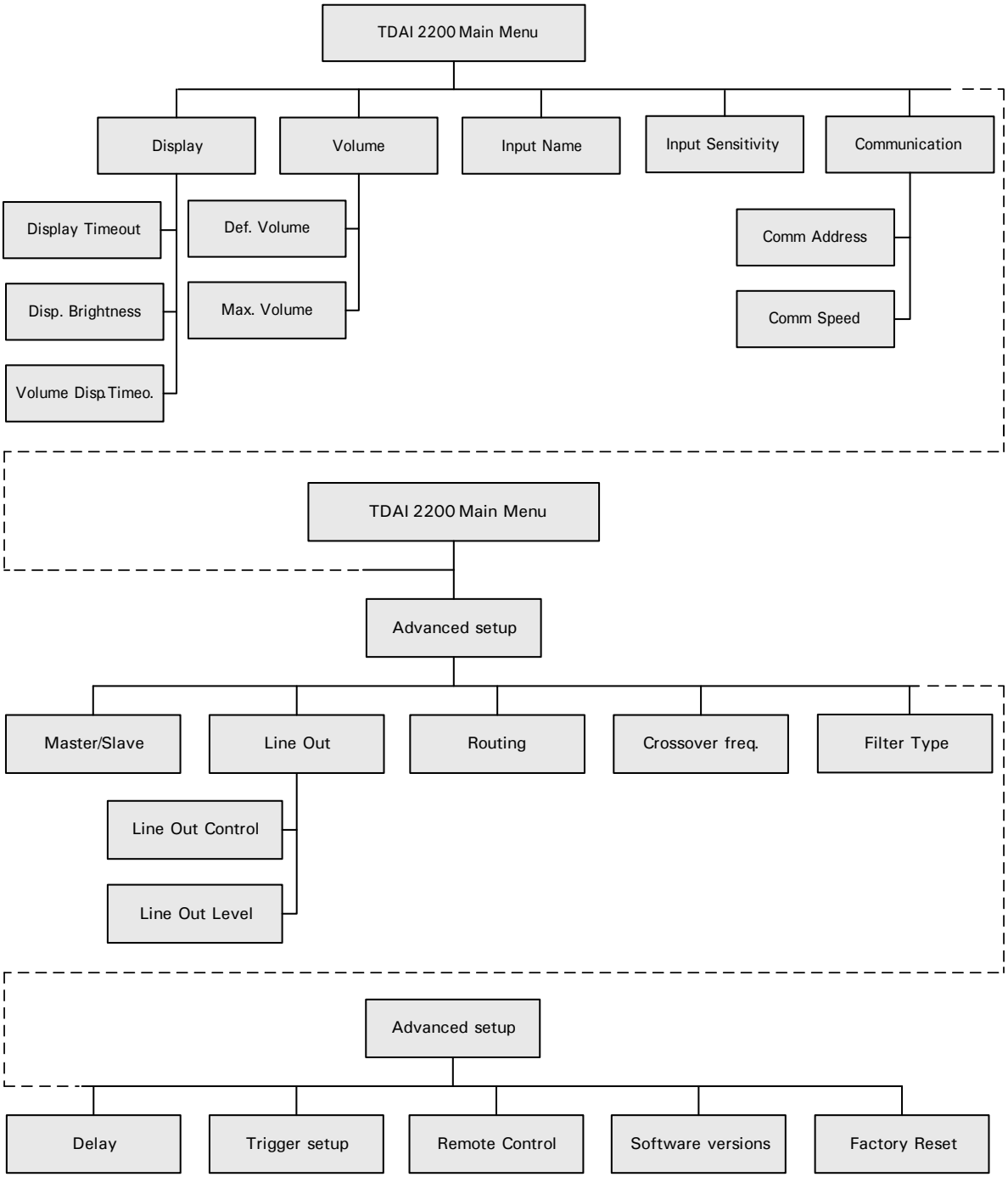
Furthermore the Volume Control is set according to the standard settings which can be altered in the 'Volume' menu.

Navigating the menu system
Pressing the Menu button on the remote or the front panel access the top level of the Menu system.

Using the left/right arrows keys the Menu system settings can now be scrolled through. To access a sub menu setting just scroll to it and press the Enter button. To change a setting, use the up/down arrows and press Enter to accept the change, or Menu to exit without applying any changes.

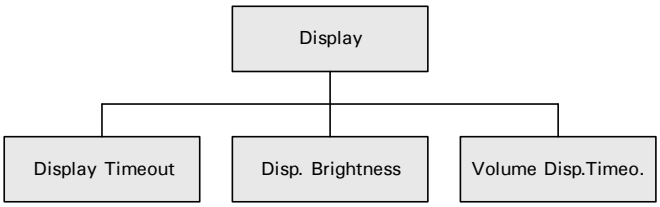
Menu Tree

This is an overview of the entire TDAI 2200 menu in software version 3.0.



Display

The sub menus accessible in the Display menu are:



Display Timeout

Display timeout set-up is used for enabling/disabling the 10 sec. display 'switch'off' feature. If enabled the Main Display reading will switch off after 10 sec of inactivity from the remote control or front panel buttons.

Disp. Brightness

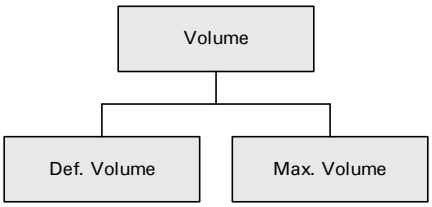
Display brightness is used to control the brightness of the display. The brightness can be set to 25%, 50%, 75% and 100%.

Volume Disp. Timeo.

If Volume Display Timeout is enabled the Volume Display reading will switch off after 10 sec of inactivity from the remote control or front panel buttons.

Volume

The sub menus accessible in the Volume menu are:



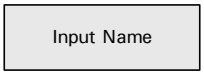
Def. Vol.

The Default Volume setting controls the default volume at start-up and can be set from 0 to 99 dB. However, a setting over 88 is not recommended as this corresponds to max output with full scale digital input.

Max. Vol.

The Maximum Volume setting is a safety precaution used for limiting the maximum volume which can be achieved by spinning the wheel or increasing volume via the remote. This can be set to avoid excessively loud sound pressure levels and/or to protect your loudspeakers against overload.

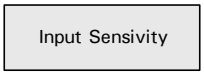
Input Name



As default, digital inputs are called Digital 1-5 and Analog inputs are called Analog 1-4. To change the name, choose an input and then between the following preset names:

- ADC, Analog 1-4, AUX, CD, CD-1, CD-2, DAB, DAT, DBS, DCC, Digital 1-5, DVD, DVD-1, DVD-2, FM, LD, MD, PC, PHONO, RADIO, RIAA, SACD, SAT, TAPE, TUNER, TV, VCR, VDP, VIDEO, VIDEO-1, VIDEO-2.

Input Sensitivity

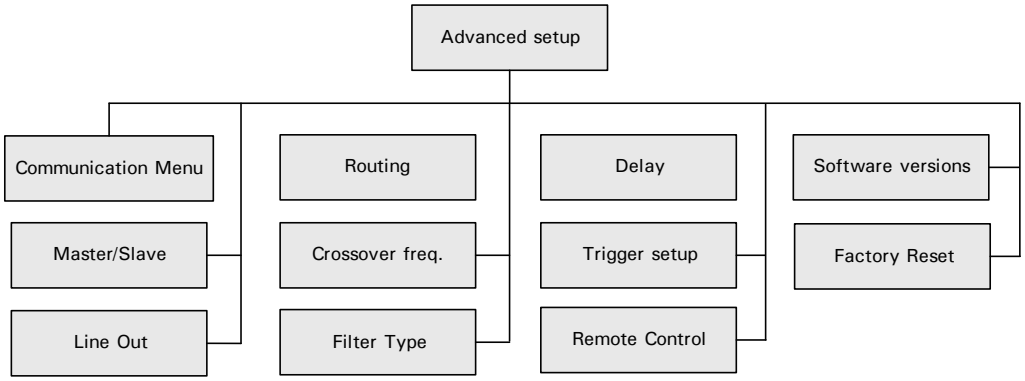


The Sensitivity adjustment enables you to match levels from different sources as well as obtaining full scale output on your amplifier. The Sensitivity can be adjusted +/-12dB in 0.1 dB steps.

	Setting the Sensitivity too high will result in clipping/distortion. Therefore, always use your ears when setting the Sensitivity

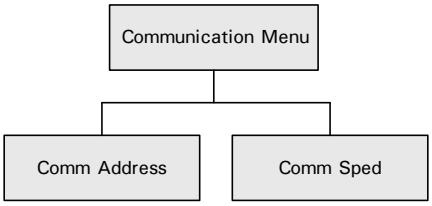
Advanced setup

The sub menus accessible in the Advanced menu are:



Communication

The sub menus accessible in the Communication menu are:



Comm Address

The Communication Address setting identifies the TDAI 2200's to the PC interface or other Lyngdorf products. In master mode the amplifier setting is normally 1, and the addresses 2-99 can be used for individual slave amplifiers, but nothing is restricted. The PC software must know the address of the TDAI 2200 in order to communicate with it.

Comm Speed

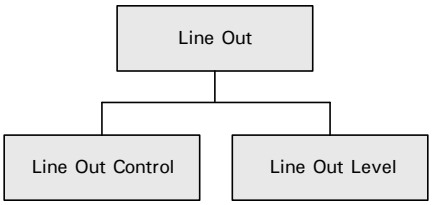
The Communication Speed setting is the RS232 Link interface speed. The default setting is 57600 baud. With different PC's and different lengths of cables the settings can be changed to 9600 or 115200 baud. If a multi-amplifier set-up is installed with Master/Slave communication, a smaller delay can be observed when using higher speeds.

Master/Slave

As default a TDAI 2200 is set as a Slave. The Master setting should be used if you are using two TDAI 2200, e.g. for bi-amping or if using one to drive the main loudspeakers and one to drive the Lyngdorf Audio cornerwoofer(s) or the subwoofer(s). When set as a Master the first TDAI will control the second TDAI (the Slave), e.g. when adjusting the volume control and when switching on and off.

Line Out

The sub menus accessible in the 'Line Out' menu are:



Line Out Control

The Line Out Control sets the output level to be Full Scale (fixed) or regulated.
Fixed means there's a constant full scale output – most often used as 'tape out' or when using a Lyngdorf Audio TDAI or SDAI as a 'slave' amplifier in a bi-amping set-up.
Regulated means that the output level will follow the level of the volume control. This setting is chosen if you have, for instance, a power amplifier or an active subwoofer connected.

	If Full Scale is selected you will constantly have full output – with huge potential for overload and damage of power amplifier and/or loudspeakers if connected.

Line Out Level

This adjusts the overall output level in steps of - 0.1 db, it can be adjusted up to – 40 db in total.

Routing

In Routing it is possible to apply different settings to the Main and Line outputs:

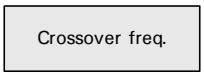
Symbol	Name	Main output	Line Output
R L	Highpass filter	X	X
R L	Lowpass filter	X	X
R→L L→R	Left and Right channel switching	X	-
M	Mono	-	X
M	Mono lowpass filter	-	X

A highpass and lowpass filter can be applied to the Main and Line outputs when you want to connect an additional amplifier or subwoofer together with your main loudspeakers.
A Mono setting is also available for the Line output, this is used when connecting a single subwoofer to just one Line output.

If no filter is selected the full frequency range will be directed to your main loudspeakers. If a filter is selected the frequencies above or below the selecter crossover frequency will be directed through the analog line-out and digital output terminals.

When a highpass or lowpass filter has been chosen, the Crossover Frequency and Filter Type menus are enabled.

Crossover frequency



The crossover frequency can be selected anywhere between 40 – 9999Hz.
It is very difficult to give exact guidelines to setting crossover frequency, filter type and order since this depends on the exact drivers and configurations. Therefore, the following recommendations should be seen as a good starting point only.

In general, the recommended crossover frequency between (sub)woofers and main speakers is between 200 - 400 Hz.
By using a high crossover frequency, the rear wall quarter wavelength reflection is removed from the main speakers.
If a Lyngdorf Audio corner woofer is used in a 2+2 set-up, a crossover frequency of 400 is recommended due to the high bandwidth of the corner woofer.
For conventional active subwoofers with built in low pass filter the recommended crossover frequency is the upper low-pass frequency of the subwoofer.
If at all possible, the low pass filter in the subwoofer should be bypassed. Due to the quarter wave reflection from the rear wall corresponding to the depth of the subwoofer cabinet we recommend an crossover point at approximately 200 Hz. You might experiment with turning the subwoofer so the driver faces the wall in a distance of 5 to 10 cm. This will increase the bandwidth of the subwoofer.

However, due to the limited bandwidth (frequency response) of most conventional subwoofers you might find it necessary to choose a lower crossover frequency.

When 'building' active speaker systems it is recommended to use the original crossover point(s) used by the manufacturer. Due to the short wavelengths of the mid/high frequencies it is essential that both crossover frequency, filter type and order as well as delay is set correctly. Therefore, creating filters for active speakers is an iterative process that requires several critical listening sessions in order to achieve seamless integration of the different speaker drivers.

Filter type

It is possible to choose from two different filter types in this menu.
LiRi: (Linkwitz Riley) 2, 4 or 8 order.

Butw: (Butterworth) 1, 2 or 4 order.

In a 2+2 set-up (main speakers + Lyngdorf Audio corner woofers) we recommend using a fourth order Linkwitz Riley filter.
In set-ups using conventional active subwoofers – again due to limited bandwidth – we recommend using a second order butterworth filter.

In active speaker systems it is recommended starting with a fourth order Linkwitz Riley filter.

Delay

Delay

If you are using a set-up with two main loudspeakers located at an identical distance to the listening position you don't need to set a delay. However, if the distance isn't identical and/or you are using a subwoofer, or a Lyngdorf Audio 2+2 system, you need to set a delay in order to ensure that the sound from each loudspeaker reaches the listening position simultaneously. This must be done for main left (ML) and right (MR) and as well as line left (LL) and right (LR).
To set the delay all you need do is to measure the distance from each loudspeaker to the listening position and enter these values in the menu. The necessary delays are then automatically calculated and applied to each channel.

	1 centimeter = 0.3937 in

	The fault message 'Values for delay exceed limits' is displayed when the difference between the distance from the speakers closest to, and the speakers furthest from, the listening position is too big. The biggest difference allowed is 340 cm / 134 in.

If the fault message appears, you can use the following solutions:
(Can be used individually or together to achieve a valid set-up with respect to the delay lengths):

- Shorten the distances between your Main and Line channel loudspeakers resulting in a more compact loudspeaker set-up.
- Arrange your loudspeaker set-up and/or your listening position in a more symmetrical set-up.

Trigger Setup

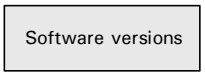
Trigger setup

Trigger setup sets the usage of the trigger output option. If e.g. an SDA 2175 power amplifier, subwoofer or similar equipment is connected to Line out, the trigger can be activated and used for switching the connected product on and off.

Remote Control

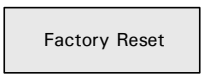
Remote Control set-up makes it possible to activate or de-activate the remote control. This is useful in set-ups with more than one TDAI 2200 amplifier in the room. The master amplifier then becomes the only one receiving signals from the remote, processes them and controls the rest of the TDAI 2200's over the Lyngdorf RS232 link.

Software versions



The Software version menu is used to check the current software version of your TDAI 2200.

Factory Reset

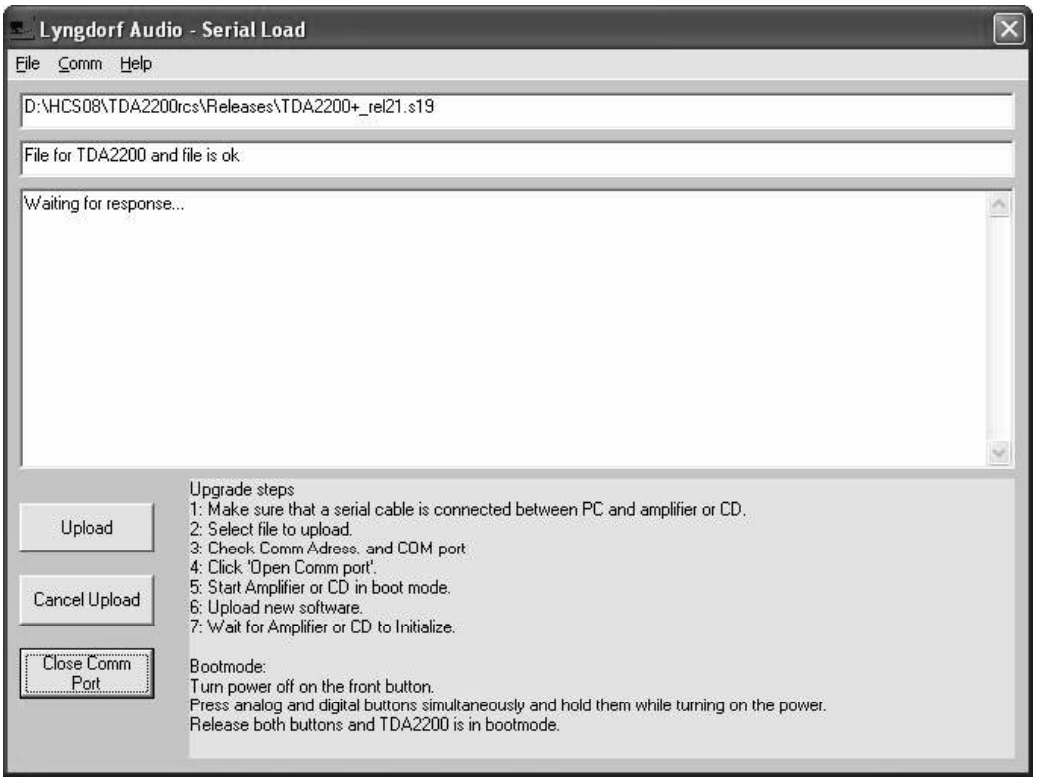


The Factory Reset is used to restore all settings to the factory settings.

	If you return to the factory settings all your personal settings will be erased.

Software upgrading

The TDAI 2200 firmware can be upgraded using the 'Lyngdorf Audio – Serial Load' software. This is in the PC package available from www.Lyngdorf.com.
Follow the upgrade steps shown below to bring the product into upgrade mode.



Connectors

Mains Connector

Mains voltage to the TDAI 2200 is applied via an IEC320 type connector. The supplied cable with safety ground should be used to connect the TDAI 2200 to a mains outlet.

	Connect the power input only to the AC source printed on the label. The warranty will not cover any damage caused by connecting to the wrong type of AC mains.
	Always disconnect the TDAI 2200 from the mains before changing any connections to its inputs or outputs.

Loudspeaker Connectors

The TDAI 2200´s loudspeaker connectors accept bare wire ends up to 5 mm in diameter. Connect the wires from each loudspeaker to each channel's + and – terminals. Do not make any other connections to the output terminals. Ensure the loudspeaker cable is inserted into the slot in the loudspeaker terminal, and the terminal is tightened firmly.

	Always disconnect the TDAI 2200 from the mains before changing any connections to its inputs or outputs.
	Make sure that no conductive part of the loudspeaker wiring is accessible. Do not connect loudspeakers with uninsulated terminals.

When the TDAI 2200 is operating, there is up to 35V DC on its output terminals with reference to ground.

	Do not connect the output from the amplifier to any other amplifier's output or any other voltage source. Do not attempt to operate the amplifier in bridged mono mode.

Trigger Connector

The TDAI 2200 is equipped with a TRIGGER OUT 3.5mm mono jack connector. The Trigger signal is a 12V short circuit-protected output signal for powering up external equipment when the TDAI 2200 is on, e.g. remotely connected SDA 2175 power amplifiers or active subwoofers.

Optional AD Converter Board

The Optional AD Converter card for the TDAI 2200 has input connectors for both balanced (XLR) and unbalanced (RCA) signals. The input impedance of the inputs are 10 kOhm.

Balanced inputs

The balanced XLR inputs are wired in accordance with IEC268:
Pin 1: Chassis and ground.
Pin 2: Hot (+).
Pin 3: Cold (-).
Shell: Chassis and ground.

Unbalanced inputs

The unbalanced RCA inputs are wired in accordance with normal practice:
Shell: Chassis and ground.
Pin: Hot (+).

Cleaning and Maintenance

	Make sure that no conductive part of the loudspeaker wiring is accessible. Do not connect loudspeakers with uninsulated terminals.

This unit does not require any regular maintenance except to keep its exterior clean. Simply wipe its exterior with a clean soft cloth. A small amount of non-abrasive cleaner may be used on the cloth to remove any excessive dirt or fingerprints. Do not use abrasive cleaners or cleaners containing liquid solvents.

Technical Specifications

Audio

Parameter	Value	Note
Balanced input connectors	3 pin XLR, gold-plated.	Case=Gnd, Pin1=Gnd, Pin2=Hot(+), Pin3=Cold(-)
Balanced input impedance	10kOhm	AC-coupled.
Unbalanced input connectors	RCA (phono) jack, gold-plated.	Case=Gnd, Tip=Hot(+)
Unbalanced input impedance	10kOhm	AC-coupled
DAC Out impedance	75 Ohm	Gain According to volume control setting. 89 dB = 0 dB with sensitivity normal and rel. volume 0 dB
Input sensitivity	4.4V (2.2V with high sens.)	200W/8ohms/89 dB Volume
Power Supply Variation	26dB	65V to 3.3V dep. On Volume
Output connectors	4 insulated binding posts, gold-plated.	Will accept bare wire ends of up to 5 mm diameter.
Output power, 8ohms	2*200W	1KHz, 0.1% THD+N
Output power, 4ohms	2*375W	1KHz, 0.1% THD+N
Nominal load impedance	4 Ohms-8 Ohms	It is safe to operate the amplifier with no load.
Frequency response	0.3Hz-33KHz	-3dB points, 8ohms load.
Frequency response	-0dB/+0.2dB	20Hz-20KHz, 8ohms load
Frequency response	-0.2dB/+0dB	20Hz-20KHz, 4ohms load
Output impedance	0.035 Ohms	20Hz-1KHz
Output impedance	0.4 Ohms	20KHz
THD+N, 1W/8ohms	0.015%	A-wgt.
THD+N, 1W/4ohms	0.02%	A-wgt.
THD+N, 100W/8ohms	0.008%	A-wgt.
THD+N, 180W/8ohms	0.01%	A-wgt.
THD+N, 375W/4ohms	0.07%	A-wgt.
S/N ratio	107dB	A-wgt. Ref. 200W/8ohms.
Dynamic range	133 dB	A-wgt. Ref. 200W/8ohms.
Channel separation	90dB	1KHz, 200W/8ohms.
Peak output current	±40A	
Output common mode voltage	Max 33V DC	Ref. Ground. The amplifier can not be used in bridged mono mode.
Output DC voltage	±5 mV	

All audio measurements, except frequency response, are measured with a 20KHz low-pass filter in accordance with AES-17.

Protection

Parameter	Value	Value
Grounding	Mains earth, chassis and audio ground are connected internally.	
Output short circuit current	±40A	
Output DC voltage	±5V @ <0.1Hz	
Over temperature	All heat sinks and mains-transformer.	Auto resetting thermal fuse in mains transformer.

Mains

Parameter	Value	Note
Mains input connector	IEC 320 cold type	Mains lead supplied.
Mains voltage range	110-120V AC, 50–60Hz	115V version
Mains voltage range	220-240V AC, 50-60Hz	230V version
Internal mains fuse	8 Amp / 0.25A	115V version
Internal mains fuse	4 Amp / 0.1A	230V version
Power consumption	1.5 W	STANDBY mode.
Power consumption	35 W	OPERATE mode, no output.
Power consumption	116 W	2*37.5W/4ohms.
Power consumption	820 W	2*300W/4ohms.

Trigger

Parameter	Value	Note
Trigger Out connector	3.5mm (1/8") mono jack	Case=Gnd, Tip=Input
Trigger Out voltage	12V DC	Short circuit protected

Mechanical

Parameter	Value	Note
Width	450mm (17.72")	
Depth	440mm (17.32")	
Height	100mm (3.94")	Including feet.
Net weight	14.5Kg (32lb.)	
Shipping weight	19.0Kg (42.0lb.)	

Technical Assistance

For latest version of control software, newest version of this document and 'Questions and Answers', please check the 'Support' section on the Lyngdorf Audio website.

If you have any problems with or questions regarding your Lyngdorf Audio product, please contact your nearest Lyngdorf Audio representative or:

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