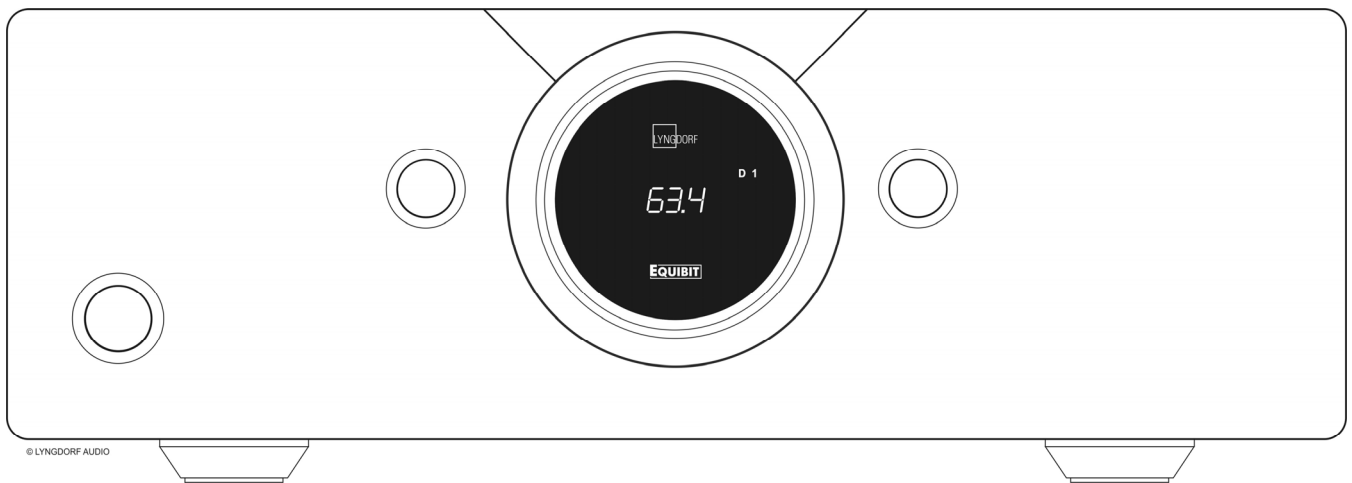


Millennium MkIV

True Digital Amplifier



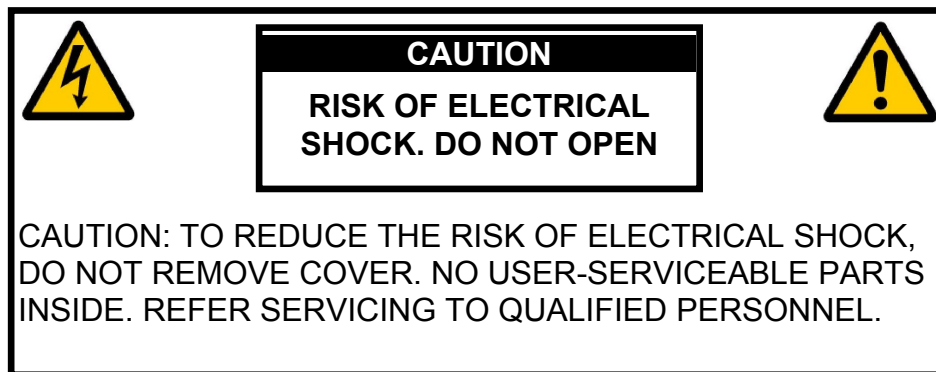
Owners Manual



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Warnings



TO REDUCE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Explanation of graphical symbols

Exclamation symbol



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

Lightning symbol



The lightning with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "Dangerous Voltage" within the products' enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to a person.

Important safety instructions

- 1:Read these instructions carefully before installing or operating this apparatus.
- 2:Keep these instructions.
- 3:Heed all warnings.
- 4:Follow all instructions.
- 5:Do not use this apparatus 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 near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
- 9:Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two pins and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10:Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. Do not use this unit with a damaged cord or plug.
- 11:Only use attachments and accessories specified by the manufacturer.
- 12:Use only with cart, stand, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tipping over.
- 13:Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14:Connect only to the proper mains voltage.
- 15:To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
- 16:Do not connect any output from the amplifier to any other amplifier's output or any other voltage source.
- 17:Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
- 18:To avoid electrical shock, make sure that no conductive part of the loudspeaker wiring is exposed while the amplifier is operating. Do not connect loudspeakers with uninsulated terminals to the amplifier.
- 19:Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug are damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

Unpacking and placement of the Millennium

The Lyngdorf Millennium is heavy and has no built in handles. Unpacking it can be a little bit tricky. To prevent back or toe injuries, we strongly recommend you get someone to help you when it's time to lift the amplifier out of the box. Or open the box, fold out the carton flaps, without removing any packaging material, carefully turn the box upside down and simply remove the box from the amplifier.

When you have carefully removed the unit and accessory kit from the carton, visually check for shipping damage. Contact both the shipper and Lyngdorf Audio immediately if the unit bears any sign of damage from mishandling. All Lyngdorf Audio equipment is carefully inspected before leaving our factory.



KEEP SHIPPING CARTON AND PACKING MATERIALS 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.

Place the Lyngdorf Millennium near the digital sources, thus keeping interconnects reasonably short. The Millennium may be placed on a shelf or in a cabinet where it's easy to operate.

Note that adequate clearance for the AC cord, speaker cables and interconnects must be left behind the Millennium. Due to the Millennium's high efficiency, it won't get very warm even after hours of operation. This will give you great flexibility in terms of placement. Just make sure that the ventilation slots at the upper section of the back panel are not covered.

Accessories

You should find the following in the accessory kit:

1. One mains cord
2. This manual
3. Remote control
4. Programming cable (RS232 Cable for firmware upgrade from a PC)

Operating voltage

The Millennium is available in a version for 115V mains voltage and in a version for 230V mains voltage.

Check the label on the Millennium rear panel and verify you have the version with the proper voltage for your geographical area.

The 115V version requires a mains voltage of 100V-120V at 50-60Hz with a current rating of 8A.

The 230V version requires a mains voltage of 200V-240V at 50-60Hz with a current rating of 4A.

The mains voltage setting for your Millennium 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 Millennium has three power modes:

1. **OFF** – No circuitry is powered.
2. **STANDBY** – The mains transformer and amplifier section is 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

Product Registration

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

Millennium MkIV serial number: _____

Introduction

Lyngdorf Millennium is the world's first true-digital power amplifier where digital audio data is converted directly into sound without analog amplification or conventional low-level D/A conversion involved at any step.

The core technology is based on patented EQUIBIT™ processing and output modules. The Lyngdorf Millennium is a modular design, a platform for state-of-the-art music reproduction. This means that you can add functions or upgrade the performance, as the technology becomes available. This manual will expand together with your Millennium. If you take the time to register your investment, we guarantee that you will get information about future upgrades and expansions.

Features

Hardware:

- Clocking of the PWM modulator is running in master mode at increased sampling frequency which insures optimal performance in the audio band compared to other implementations
- Ultra low phase noise / low jitter clock system extends the dynamic range and gives extremely low jitter
- All digital signals on the PCB are noise optimized regarding transmission line load to reduce interference to clock systems.
- Built in Audio DSP's for Equalizers, crossovers delays etc.
- New Digital transceiver supporting 192kHz single wire interface
- New Asynchronous Sample Rate Converter with internal conversion rate always clear of 1:1 conversion problems.
- Optimized low jitter clock system
- PC interface for programming, control and upgrades
- High-end Balanced DAC line out for active system setup

Performance:

- THD+N level -107dB A-weighted both channels driven at -60dB@1kHz
- THD+N level -104dB with both channels driven at -60dB@1kHz
- THD+N < 0.01% @1kHz 10W in 8 Ohms (<0.02% from 1-150W)
- THD+N < 0.015% @100W from 20-20 kHz
- Dynamic range 107dB digital plus 26 dB PSU variation - totals 133 dB
- DAC line out Dynamic range 116dB A-weighted
- DAC line out SN+THD ratio -105dB @ FS -1dB Output Both channels driven @ 1kHz
- DAC linearity 20-20kHz +/-0.02dB
- ASRC THD+N -140dB (20Hz-Fs/2) Dynamic range 144 dB

Software:

- PC Interface for control of all built in functions, remote accessible via RS232 interface. Firmware upgradable from PC, DSP control software.
- 8 Presets with full storage of all filter parameters for A/B testing, different seating, music modes etc.
- 20 band Parametric Equalizer and delays up to 7 meters per channel.

Quick set-up

A. Connect your speaker cables to the terminals on the back panel. The speaker impedance should be 4-16 Ohms. If the speakers can be bi-wired, use both sets of terminals. Make sure that the red (+) terminal gets connected with the corresponding positive (+) terminal on your speaker. European versions of the Millennium will not accept banana plugs. Do not attempt to remove the plastic safety plugs, use spades or simply bare wires.

B. Connect your CD/DVD/MD/DAT player to one of the digital inputs or an analog source to the A.I.M. Turn on the power to your source.

C. Turn on the Millennium with the power button (1).

D. Press the analog or digital (2/4) input selector once. The Millennium will now boot up and you must select the input where you connected the source. If the Equibit logo is flashing, press the input selectors 2 or 4 to find the right source. When the Millennium detects a signal, the logo will stop flashing.

E. Adjust the volume with the wheel (3) to a moderate level.

F. Activate your digital or analog source and adjust the volume.

If you experience any problems during this procedure, please refer to the following pages for a more detailed explanation of the set-up.

Front panel

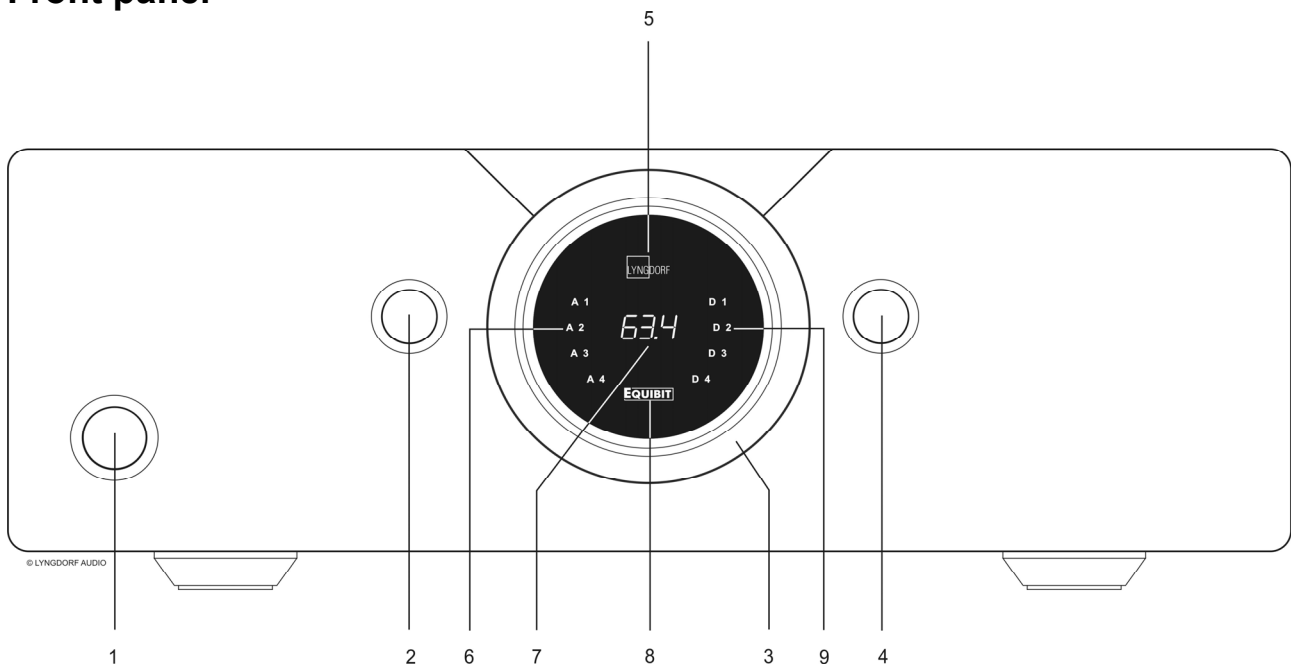


Fig 1: Millennium front panel.

Controls

The buttons/controls on the front panel of the Millennium can all be used either with direct presses on the front or by operating the similar keys on the included remote control. All keys on the front except from the Mains switch (1) can be found on the remote control as well.

(1) Mains switch. Powers the Millennium on/off. Standby mode is selected with the remote control only.

(2) Analog input selector. The analog input selector is only active when the optional Lyngdorf Analog Input Module is connected to the Millennium.

(3) Volume control wheel & display

(4) Digital Input selector

Changes to Digital input, or if already selected, cycles to the next Digital input.

The wheel

5) Lyngdorf logo & Standby indicator

6) Analog input indicator

7) Digital input indicator

8) Equibit logo & input lock indicator

9) Digital input indicator

Adjusting the volume

The volume can be adjusted by turning the big wheel or pressing volume up/down on the remote control. The volume level is displayed in decibels and is adjusted in uniform steps of 0.1dB.

A setting over 88.0dB is not recommended as this corresponds to max output with full scale digital input. However, if a CD isn't recorded in full scale, the volume can be turned up further than 88.0dB without any clipping/distortion.

Pre-set Volume

When the Millennium is turned on, the volume is set to a pre-programmed value. This level can easily be changed; adjust the volume to the desired level, press the A and D buttons Simultaneously for 2 seconds. The display will confirm the setting by flashing the volume and the amplifier automatically enters standby mode.

Maximum output level

The volume control with its low-friction, high precision ball bearings can easily spin up to full output. To prevent damage to your speakers, a maximum volume level can easily be programmed, you can find out how to do this in the section "Remote Control".

Power

At a first glance, the operation of this very accurate dB scaled volume control may come as a bit of a surprise. Normal operation will be at levels that seem to be very close to the maximum power of the amplifier.

The dB's scale is not linear

Volume level corresponds to full scale input from e.g. a CD-player.

88dB.....	150 W
85dB.....	75 W
82dB.....	30 W
79dB.....	15 W
76dB.....	3 W
73dB.....	1.5W

Keep in mind that the dB scale is not linear, a 10dB increase corresponds to 10 times the power level and a 3dB increase equals 2 times the power.

Set the dimmer display light control

When the Millennium is in operational mode (ON), three levels of display-light settings are possible. The DIM function on the remote control (explained later) toggles between:

A. Maximum light

B. Dimmed

C. Dimmed and volume display/input indicators off

Regardless of this setting, any change in display information activates maximum light for two seconds.

Polarity

You can switch the polarity 180 degrees with the remote control (explained later). The display confirms the polarity with either "pos" or "neg".

Mute

When "Mute" is activated from the remote control the display shows "---" and the amp will be muted. Press the "Mute" button again to deactivate the mute status. If the volume is changed when Millennium is muted, the display will show the volume for 3 seconds.

Advanced Set-up

Check the mains voltage

Attempting to operate the Millennium at an incorrect voltage can damage the unit! Power is supplied via the IEC-connector on the back panel. Neither the voltage nor the line frequency setting may be changed by the user. Make sure that the label on the rear panel of the Millennium indicates the correct AC operating voltage for your country.

When the power switch (1) is pressed - the standby circuitry, which controls the mains relay will be activated. The amplifier will start in standby mode indicated by the red Lyngdorf logo. After a few seconds, the amplifier can be switched into operational mode by pressing any of the two input selector (2 or 4) buttons or using the power button on the remote control. In operational mode, the display located in the wheel will be visible to bring the amp back to standby mode, press the power button on the remote or press the input selector buttons simultaneously for 2 seconds. This will also default the volume setting (See section on volume control).

Rear panel

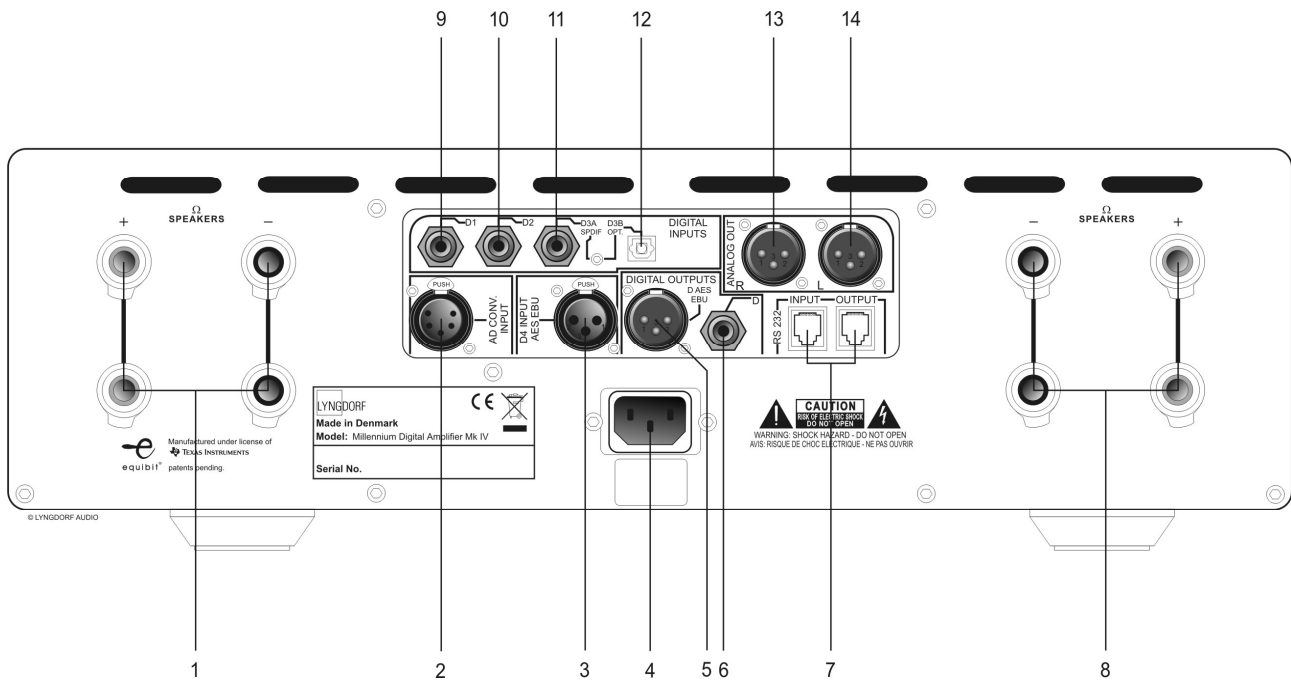


Fig 2: Millennium rear panel.

Do not cover or obstruct the ventilation slots on the rear panel.

- 1) Speaker terminals
- 2) AD Converter Input
- 3) D4 Input AES EBU
- 4) IEC Mains power connector
- 5) Digital Outputs D AES EBU
- 6) Digital Output D
- 7) RS 232 Input and Output
- 8) Speaker terminals
- 9) Digital Input D1
- 10) Digital Input D2
- 11) Digital Input D3A SPDIF
- 12) Digital Input D3B Optical
- 13) Analog Output R
- 14) Analog Output L

There are 4 digital inputs on the back panel corresponding to the 4 input indicators at the right hand section of the display:

- DI - RCA input
- D2 - RCA input
- D3A - Digital Input D3A SPDIF
- D4B - Digital Input D3B Optical

The D (4) button on the front panel and on the remote control is used to toggle between the inputs.

Digital Output

The selected analog or digital input source is relayed to the digital output. Use the output for recording CD's etc.

Analog Inputs

One of the two 5-pole XLRs is dedicated for the optional Millennium ADC, which will be clock synchronised and powered by the Millennium. When the Millennium ADC is connected, one of four analog inputs can be selected by toggling through input AI to 44. When the Millennium ADC is not present, the AI indicator will flash and the Millennium returns to the previous digital input.

Address setting for network operation

When used in a network in connection with either a RCS/TCS or another Millennium it is essential to set both the communication speed and address correctly. The address usage in a network is restricted by the following rules:

Address	Functionality	Comment
0	Reserved	Normally not used
1	Master	Master, TCS, RCS
2-..	Slave	Slave

If more than one amplifier is present in the network different addresses must be appointed to each amplifier by the Millennium software.

The INPUT/AUX connectors on the back panel are used for connectivity over standard RJ12 cables in a suitable length. For Slave amplifiers the input is used to pass information from the Master or a RCS/TCS to the amplifier. For Master amplifiers the broadcast information will be passed to the slave on the AUX connector which also passes any input information in a daisy chain to the next Lyngdorf product.

Remote Control

The remote control is used to access the Millennium and replicate some of the buttons directly accessible on the front panel. The four buttons used for selecting which device to control are described below. To control the Millennium the AMP key should be pressed.

- **Amp** – Selects the remote for operation with Millennium or any Lyngdorf amplifier.
- **RCS** – No function.
- **CD** - Selects the remote for operation with a Lyngdorf CD Player.
- **Tuner** – No function.
- **Standby** – The standby button toggles the Millennium between active “On” and standby mode.
- **Digital** – Changes to Digital input, or if already selected, cycles to the next Digital input.
- **Analog** – Changes to Analog input, or if already selected, cycles to the next Analog input.
- **Button 1-8** – Preset 1-7 can be selected with buttons 1-7, default presets are all linear bypass, and preset selection of the active preset will only affect the sound after changing the preset contents with the DSP software. Button 8 selects bypass.
- **UP/DOWN and Channel +/-** – Cycles in either Analog or Digital input.
- **Volume Up/down** – Changes volume in the chosen direction
- **Mute** – Toggles Mute function on/off



Some special functions can be controlled by pressing Info first followed by a numeric key:

- **Info+1** – Shows the software version in the display.
- **Info+2** – Show the device address in the display.
- **Info+3** – Increments device address by one and shows the new address.
- **Info+4** – Decrements device address by one and shows the new address.
- **Info+5** – Toggles Master/Slave. The display shows -r- for master and -c- for slave.
- **Info+6** – Change display light dimmer.
- **Info+7** – Toggles baud rate 9600/57600. The display shows either “960” or “576”.
- **Info+8** – Changes polarity pos/neg. The display shows -P- for pos. and -n- for neg.
- **Info+9** – Stores actual volume as maximum volume level. The display shows either “on” or “OFF”

The Millennium can act as Master in a set-up with more than one Millennium amplifier. In this case the remote control is active on the Master Millennium, and disabled on the Slave Millennium which is operated via the broadcast codes. All information on usage is passed on to the slave i.e. on/off, volume, mute, preset.

Front panel operations

The operations of the remote control receiver can be bypassed on the front panel for the Millennium. Bypassing the remote control is done with a long press on the Analog left selection key "A". When the remote is turned off the Lyngdorf Logo blinks twice after a 2 sec. press. If the remote functionality is turned on – the Lyngdorf Logo blinks once.

Software

Software and documentation, for both PC and Millennium, can be downloaded from our homepage at <http://www.lyngdorf.com>.

The software for PC is:

- Serial Load – used for upgrading the software in Millennium
- AmpCom – used for controlling and setting up Millennium from a PC.
- Lyngdorf DSP – used for making digital filters, crossover and voicing in Millennium.

Connectors

Mains Connector

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



WARNING: 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.



WARNING: Always disconnect the Millennium from the mains before changing any connections to its inputs or outputs.

Loudspeaker connectors

The Millennium'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. The loudspeaker cable is inserted into the slot in the loudspeaker terminal, and the terminal is tightened firmly.



WARNING: Always disconnect the Millennium from the mains before changing any connections to its inputs or outputs.



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

When the Millennium 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.

Cleaning and maintenance



Always unplug the unit from the electrical outlet before cleaning.

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
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*150W	1KHz, 0.1% THD+N
Output power, 4ohms	2*300W	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	0.025 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	112dB	A-wgt. Ref. 150W/8ohms.
Dynamic range	139 dB	A-wgt. Ref. 150W/8ohms.
Channel separation	90dB	1KHz, 150W/8ohms.
Peak output current	±60A	
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	Note
Grounding	Mains earth, chassis and audio ground are connected internally.	
Output short circuit current	±60A	
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	100-120V AC, 50–60Hz	115V version
Mains voltage range	200-240V 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.

Mechanical

Parameter	Value	Note
Width	450mm (17.72")	
Depth	435mm (13.39")	Excluding loudspeaker connectors (over wheel)
Depth	455mm (14.21")	Including loudspeaker connectors (over wheel.
Height	88.8mm (3.5")	Excluding feet.
Height	100.6mm (3.96")	Including feet.
Net weight	18.0Kg (37lb.)	
Shipping weight	20.0Kg (41lb.)	

Trouble Shooting

Protection Mode

A sophisticated monitoring circuit controls the operation of the amplifier. When an error is detected, the amplifier shuts down into protection mode immediately and indicates the status by flashing the Lyngdorf logo.

Protection mode can be triggered by:

1. Overload/short-circuit of the speaker outputs (limits current to approx. 35 Amps)
2. DC detected at the speaker outputs; this can be due to extreme program material.
3. Internal power failure burned fuses etc.
4. Mains supply voltage is too low or too high.
5. Overheating of the amplifier.

Most problems are temporary

Most of the above mentioned error conditions are normally temporary. When the Millennium goes into protection mode, switch off the power and inspect the amplifier. Check the speaker cables, feel if the cover is very hot. Turn on the amplifier again to see if normal operation mode may be resumed.

If the error condition persists, the Millennium will return to protection mode immediately. If this is the case, the Millennium needs authorised service.

NOTE:

- No bridge coupling is possible.
- The frequency response of the Millennium extends down to DC. Playback of material with extreme infrasonic program material may cause the amp to go into protection mode in order to protect the speakers.

Support

Please check www.lyngdorf.com for latest version of control software, and newest version of this document.

Technical assistance

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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Ulvevej 28
7800 Skive
Denmark

E-mail: info@lyngdorf.com
Web-site: www.lyngdorf.com

