Amati.linea Streaming Player

Amati.linea Streaming Player – get inspiration from invisible, lossless music

Amati.linea plays all your network music in HD quality staying design wise, powerfull and affordable. Not only the listening experience is made beautiful with Amati.linea, but the domestic visual experience as well.

Amati.linea wants people to distribute their 'audio-money' for real quality and sound experience not investing it into the office computer functionality! Amati.linea takes care of the flawless stream, the perfect timing needed to get so deep into your digital recordings, you'll completely rediscover everything you've ever heard in digital.

Amati.linea allows to share your media library throughout all devices in your home.

Music sources supported in-box:

- UpnP server
- DLNA server
- AirPlay sender
- FTP, NFS, HTTP servers
- Internet radio
- Internet music services
- Playback from USB storage

High quality sound:

- Up to 24 bit 192 kHz
- FLAC support

Invisible concept:

- Music device embedded to wall boxes, no wires
- DIN rail mountable
- Tiny design 52x90x51 mm

BMS ready solution:

- KNXnet/IP on-board
- Modbus RTU/TCP on-board
- Bacnet/IP support

Amati.line = Highest quality

- Hight grade components
- High-end engineering attitude
- High efficiency

- 2 x 35W / 4Ohms built-in amps (2-speakers)
- 2 USB on board for WiFi, Music storage
- WEB-based visualization and management
- Easy operation using iPhone / iPod / iPad app, Android compatible app
- Input/output ports for control of external devices (amps, lighting etc.)

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Technical specification

Feature / Product	Streaming player HD with digital amplifier	Streaming player without amplifier
Connectivity	– 1 x 100BaseTX ethernet – 2 x USB – 1 x RS485 – 1 x 2-loudspeaker output	– 1 x 100BaseTX ethernet – 2 x USB, – 1 x RS485 – 1 x line-out
Audio amplifier	– Total harmonic distortion + noise (f = 1 kHz, PO = 10 W): 0.05% – SNR (Maximum output at THD+N < 1%, f = 1 kHz, A-weighted): > 100 dB – Music power THD+N<1%: 35 W/channel	-
ADC/DAC	– PowerDAC based on Equibit™ technology – Nichikon MUSE premium grade acoustic series capacitors	– Wolfson Hi-End multi bit delta-sigma DAC 24bit 192kHz with advanced digital filtering – Nichikon MUSE premium grade acoustic series capacitors – Ultra fast Op amps – Ultra-low noise linear regulators – Polystyrol and polypropylen capacitors in the signal path – DAC Signal to Noise Ratio: 100dB – DAC Dynamic Range: 95dB – DAC Total Harmonic Distortion (1kHz, -3dBfs): -92 dB – ADC Signal to Noise Ratio: 90dB – ADC Dynamic Range: 90dB – ADC Total Harmonic Distortion (1kHz, -3dBfs): -84 dB
Sampling frequencies / resolutions	– 32, 44, 48, 88, 96, 192 kHz / 16, 20, 24 bit. – All sampling frequencies upsamled to 352.8 kHz or 384 kHz	– 32, 44, 48, 88, 96, 192 kHz / 16, 20, 24 bit
Supported audio formats	MP3, WAV, AAC, WMA, FLAC, lossless FLAC 96/24, 24/192	MP3, WAV, AAC, WMA, FLAC, lossless FLAC 96/24
Protocols supported	DLNA, UPnP, AirPlay, FTP, NFS, HTTP, KNXnet/IP, Modbus TCP/RTU, Bacnet/IP	
Clock Oscillator	Low jitter (0.5 psec typ.)	
Power supply supported	18-26 VDC	7-36 VDC
Power supply in the kit	24 VDC 2.7 A	24 VDC 0.8 A
Power consumption	1.2W idle mode	
Weight	0.2 kg	
Dimensions/Enclosure	52 x 90 x 51 mm (W x H x D), DIN-rail plastic case	
Operating temperature	-30ºC to 85ºC	
Warranty	2 years	

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Features

Make your music invisible
Invisible concept is provided by means of making the system embedded in wall boxes, without visible wiring.
Furthermore, dimensions of amati.linea is just 52 x 90 x 51 mm. Home owner will appreciate the concept without interfering with interior.

Distributed music
System can works as streaming server and also can render music from local sources connected to USB ports (HDD, USB flash etc.)

Open standards supported
For streaming system support connection by open protocols like UpnP, DLNA, FTP

Superior sound engineering
Amati.linea is a sophisticated combination of high performance DAC, robust digital amplifier, and plenty of music sources support. Amati.linea defines the modern integrated amplifier. With an appealing small footprint, it is attractive and power efficient. Featuring the world's most advanced technology, as well as uncompromised component quality, Amati.linea is optimized for musical performance and makes sound quality outstanding.

True digital amplifier
Amati.linea doesn't use traditional DAC and analog amplifier, instead Power DAC based on Equibit™ technology is used. Power DAC based on Equibit™ is used in such high end devices as TacT Millennium amplifier and STEINWAY LYNGDORF. Amati.linea utilizes true digital amplification, which allows receiving the original digital signal from the processor, thus ensuring that the signal processing is handled 100% in the digital domain.

Better SNR and THD
Direct digital construction provides better SNR and THD than the digital+analog construction.

Performance matters
Audio processing is operated at 384 kHz switching rate for 32-, 48-, 96-, and 192 kHz data, and at a 352.8 kHz switching rate for 44.1-, 88.2-, and 176.4 kHz data. The 8× upsampling combined with the fourthorder noise shaper provides a flat noise floor and excellent dynamic range from 20 Hz to 20 kHz

Very low jitter
Very low jitter is provided by extremely linear Clock Oscillator (Jitter RMS: 0.5psec typ., 1psec max). The oscillator utilizes Fundamental or High Q Third Overtone crystal design providing very low Jitter and Phase Noise. No Sub-Harmonics are present in the Output Signal. Power DAC connected to host by I2S bus delivers best jitter figure.

Fast multi-level visualization creation and processing
Create your visualization map for Amati.linea device monitoring, control and your music distribution.

PC, Android/iOS touch visualization
A specific touch visualization app is provided in the device for Android and iOS system based touch devices.

Easy integration in building automation sysem
Most widely used building automation standards are supported in box – KNXnet/IP or other building automation protocols through custom controllers, using serial communication.

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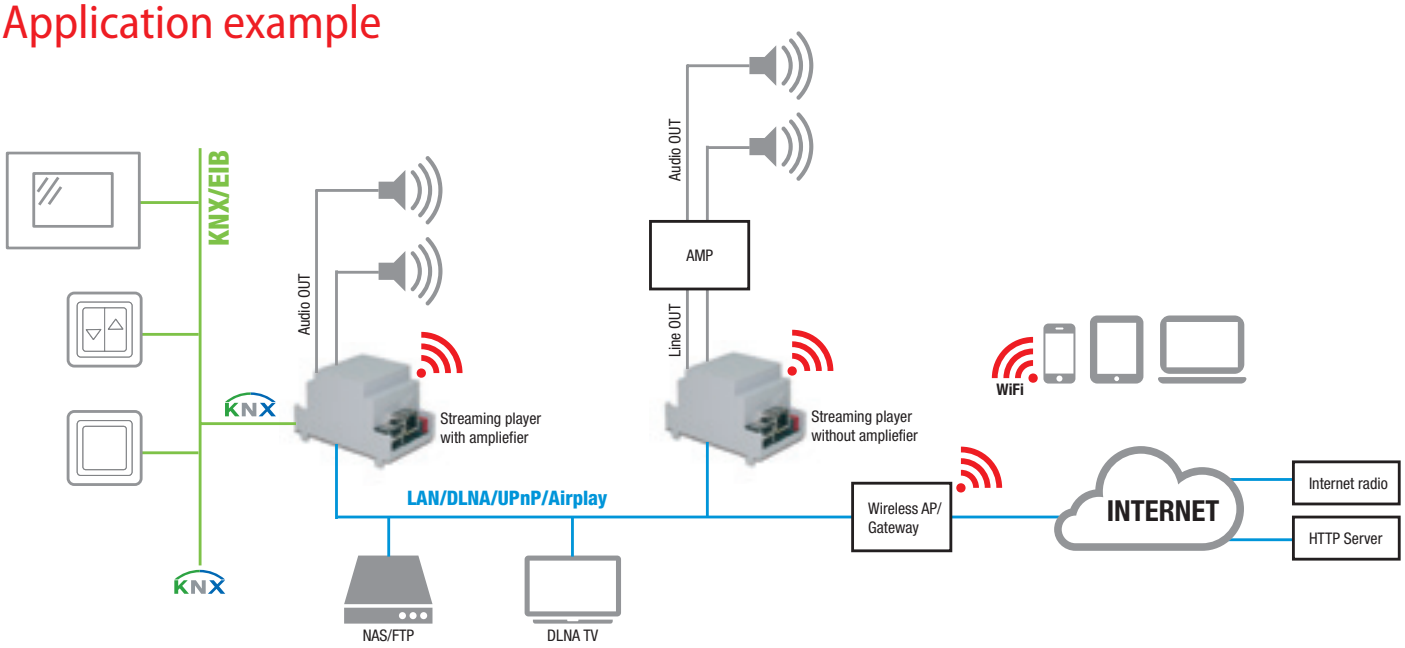
Application example



Used functionality:

- Play/stream music content on Streaming player from the following:
  - NAS/FTP
  - HTTP server, Internet radio
  - iPhone, iPad
  - USB Flash (on specific Streaming Player)
- Control of the Streaming player from:
  - iPhone, iPad app: source selection, playlists, music control etc.
  - Laptop: remotely connecting to one of Streaming Players visualization server, specific source selection for specific Streaming Player, meshing support (control all Players from one visualization), integration with building automation protocols etc.
  - KNX/EIB building automation system sensors or automatically on events: Next/Previous, Pause, Mute etc.

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What is what in vocaburary of DLNA, UpnP and AirPlay?

Element / Definition	DLNA Digital Media Renderer	DLNA Digital Media Player	DLNA Digital Media Server	DLNA Digital Media Controller	UPnP MediaRenderer DCP	UPnP AV media server	UPnP Remote User Interface	AirPlay receiver	AirPlay sender
Streaming Players	x				x			x	
iPhone				x			x	x	x
iPad				x			x	x	x
DLNA TV		x							
NAS			x			x			
FTP			x			x			
HTTP server			x			x			
Internet radio			x			x			
Laptop				x			x		

- *DLNA Digital Media Server (DMS)* – the devices store content and make it available to networked digital media players (DMP) and digital media renderers (DMR).
- *Digital Media Player (DMP)* – the devices find content on digital media servers (DMS) and provide playback and rendering capabilities.
- *Digital Media Renderer (DMR)* - the devices play content received from a digital media controller (DMC), which will find content from a digital media server (DMS).
- *Digital Media Controller (DMC)* – the devices find content on digital media servers (DMS) and play it on digital media renderers (DMR).
- *UPnP AV media server* – the 'master' device that provides media library information and streams media-data to UPnP-clients on the network.
- *UPnP MediaRenderer DCP* – the 'slave' device that can render (play) content.
- *UPnP Remote User Interface* – the device sends/receives control-commands between the UPnP-client and UPnP-server over network.
- *AirPlay sender* – the devices include computers running iTunes and devices as iPhones, iPods, iPads running iOS.
- *AirPlay receiver* – the device that plays content.

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From CD to digital media age

Optics-based solutions

Pros.	Cons.
very simple operating systems	microvibrational influence on sound quality magnified
no viruses ever, plug and play functionality	expensive, massive physical realm solutions
the romance of putting it into the machine to play it	numerous optical tweaks reveal obvious bottlenecks of performance
psychology of "Albums" is maintained physically	High-res DVD Audio / SACD war has been surpassed by ease of download
	Acoustic noise

Solid state solutions

Pros.	Cons.
absence of optical components	plethora of operating system services competing for clock time
download capability	overall system complexity due to non-dedicated engineering
storage media becoming cheaper by the day	clock sharing bottleneck regarding Jitter performance
cloud storage (safer backup) on the horizon	power supply issues remain just as important as before

- Is there a way to get the best of both worlds into one machine and circumvent all of the cons of both approaches? **Amati.linea Streaming Player!**
- Perfect stream form = date associated with a running audio clock.
- **Amati.linea operating system functions exactly off of the very audio clock.**
  When the operating system is functioning the data read off of the digital stream is directly coupled to the clock's wavefronts and that is all. The stream is the result of 44,100 such operations per second. And this stream is very close to flawless in the time domain.
- Amati.linea ral time operating system (RTOS) provides perfect timing operation.

Before:

When a file is to be played which needs, say, a 48 kHz clock, this is then no longer possible with the original 44.1 kHz clock we used for the 44.1k file before. The solution most computer operating systems use to solve this is an extensive array of clocking functions, each running at different speeds and through what is known as PLLs (Phase Locked Loops) which introduce Jitter into the stream. However, the solution is easier in an engineering sense because only one clock is necessary for all of the different frequencies listed above. You can "round out the clock ticks" to get to the frequencies you need. But this "rounding out" probably need not be discussed here with you. Of course, it results in "that harsh digital computer audio sound".

Now:

Instead, what we have done, is have engineered a completely synchronous operating system itself.
When a 48k file needs to be played exact clock is turned. This is done seamlessly and in no time. The quality depends on digital oscillator quality. In our case we use oscillator with extremely low jitter and phase stability. Any file of any sampling frequency can be played right after one another.

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Technology not just another switching amplifier

Functionally, Amati.linea is an integrated amplifier that replaces a DAC, preamplifier, and power amplifier. Amati.linea eliminates from a traditional signal path all the electronics of a DAC as well as the active analog gain stages of a preamplifier and power amplifier. It does this by converting the PCM signal from a digital source directly into a pulse-width modulation (PWM) signal that turns the amati.linea's output transistors on and off. That's it—no digital filter, no DACs, no multiple stages of analog amplification, no interconnects, no jacks, no analog volume control, no preamp. The conversion from the digital domain to the analog domain occurs as a by-product of the switching output stage and its analog filter.

Class D amp	Amati.linea digital amp
Analog input signals are converted to a series of pulses that turn the output transistors fully on or fully off. The signal's amplitude is contained in the pulse widths. An output filter smooths the pulses into a continuous waveform.	PCM digital signals fed to the amplifier's input stay in the digital domain and are converted by digital-signal processing (DSP) to the pulse-width modulated signal that drives the output transistors.
Signal path: – e.g. in CD player, data read from the disc go through a digital filter and are converted to analog with a DAC; – the DAC's current output is converted to a voltage with a current-to-voltage converter; – the signal is low-pass filtered and then amplified/buffered in the CD player's analog-output stage; – analog output signal travels down interconnects to a preamplifier with its several stages of amplification, volume control, and output buffer. The preamp's output then travels down another pair of interconnects to the power amplifier, which typically employs an input stage, a driver stage, and the switching output stage; – in addition to the D/A conversion, that's typically six or seven active amplification stages before the signal gets to the power amplifier's output stage	Signal path: – PCM data are converted by DSP into the pulse-width modulation signal that drives the output transistors. That's it; – there are no analog gain stages between the PCM data and your loudspeakers; – the signal stays in the digital domain until the switching output stage, which, by its nature, acts as a digital-to-analog converter in concert with the output filter; – the volume is adjusted in DSP
Feedback isn't practical in switching amplifiers because of the delay involved in sending part of the output signal back to the input. Switching stages operate on extraordinarily precise timing; a glitch of a nanosecond can cause the output stage to lock up.	The use of feedback around the output stage to reduce distortion. Feedback takes part of the output signal, inverts it, and sends it back to the input. The technique lowers distortion.
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In digital source, analog preamplifier, and analog power amplifier, any noise introduced ahead of the power amplifier greatly degrades the system's signal-to-noise ratio (SNR).	Amati.linea can be thought as a DAC with gain and judge its technical performance using the same metrics as those employed in evaluating D/A quality. For example, at -120dB, the linearity error is less than +/-0.1dB (amazing spec), and the unit provides useful resolution down to an astounding –135dB. Amati.linea's topology has interesting ramifications for a system's overall noise performance.
For example: we start with a CD player with a SNR of 115dB, feed its output to a preamplifier with a SNR of 108dB, and then drive a power amplifier whose intrinsic SNR is 115dB (all great specs)	
The system's overall SNR is only 84.1dB referenced to 1W (all SNR numbers are unweighted). Noise at the front of the chain gets amplified by the power amplifier, no matter how quiet that amplifier is.	The only source of noise is in the DSP and the switching output stage, and the noise level is completely independent of the gain. That is, the SNR doesn't degrade at low volume. The DSP's noise is kept low in part because of the 35-bit data path. Amati.linea has SNR of 91dB (unweighted, referenced to 1w) at any signal level.

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