AC IN: 100-240 V~
50-60Hz 30W MAX.

PUSH

AES OUT

AES IN

R

L

MONITOR OUT

LINE OUT RIGHT

LINE OUT LEFT

LINE IN RIGHT

LINE IN LEFT

PUSH   PUSH

BATTERY IN 9 -18V ===

WORD CLOCK   OUT   IN

S/PDIF COAX   OUT   IN

S/PDIF ADAT OPT.

HiLo

DESIGNED AND MANUFACTURED IN USA
BY LYNX STUDIO TECHNOLOGY, INC.
www.lynxstudio.com

LSLOT EXPANSION PORT

LT-USB

Lynx

Lynx

REFERENCE A/D D/A
CONVERTER SYSTEM

VU   VU

Lynx Studio Technology

Line Out

Hilo

PHONES

The ultimate goal for Hilo is to be best sounding two-channel converter. Period. Hilo must maintain the transparent audio quality of our widely acclaimed Aurora converters, but up the ante in terms of performance. Three years of research and development have resulted in a product that more than meets this goal.

REENGINEERING CONVERSION TECHNOLOGY

To achieve unprecedented noise and distortion levels a new design for the analog and converter stages, BiLynear™ conversion technology was developed. It is based on a completely differential topology that minimizes noise pickup and reduces even-order distortion components. High-speed, low-noise differential amplifiers are used to

provide an ideal interface for the converter devices. Resistor noise, which contributes significantly to system noise, is minimized by the judicious use of low-noise precision resistors.

Many A/D and D/A converter devices were analyzed for Hilo, but the selection was based on devices that offered consistent performance at all sample rates, levels, and signal frequencies. To improve dynamic range and lower noise, two A/D converters are used in parallel on each line input channel. Their combined output provides an additional 3dB of signal to noise. Similarly, the line outputs are driven by two parallel D/A converters offering the same benefit.

The line inputs are balanced and buffered to provide high input impedance and rejection of common-mode noise. The line outputs faithfully mimic the qualities of transformers using precision amplifier circuitry. Both inputs and outputs exhibit an extremely flat frequency response of ±0.02dB, worst case.

A converter's full-scale signal level must match a studio's line level closely to minimize noise. Hilo provides eight standard trim settings on line inputs and outputs to accomplish this. Telecom-quality relays with gold-plated contacts are used for this function to avoid additional distortion and noise caused by other gain-switching methods which are typically used.

Without a low-jitter sample clock, A/D and D/A converters are severely crippled in their ability to accurately sample analog signals. Hilo incorporates Lynx's proven SynchroLock™ sample clock which generates an extremely low-jitter sample clock when syncing internally as well as to external high-jitter clock sources.

BEYOND THE TWO CHANNEL CONVERTER

Having met our initial design goals, we felt that it was mandatory that Hilo provide monitoring performance on par with the conversion. A monitor output and headphone amplifier were added.

The monitor output provides a secondary balanced analog output which is ideal for driving powered monitors. Accordingly, the volume for this output can be adjusted in 0.5 dB increments while maintaining accurate channel-to-channel gain matching - something a standard potentiometer is incapable of. The proprietary technology used for this volume control delivers extremely low-distortion compared to other methods. An internal gain setting jumper provides an additional 14 dB to support using the monitor output as an alternate line output. To provide a mix independent of the line outputs, a separate D/A converter is used for the monitor output.

The performance of Hilo's headphone amplifier is better than stand-alone headphone amplifiers. Building on the technology used for the line outputs, it adds a high-current stage capable of driving any commercially available set of headphones while maintaining extremely low distortion.

To prevent the large current draw required for this output from affecting the performance of the other converter sections, the headphone amplifier derives power from an independent analog power supply. As with the monitor output, a separate D/A converter and 0.5 dB stepped volume control is provided for additional flexibility and control.

RAISING THE BAR ON DESIGN

Implementation of this high-performance analog I/O relies heavily on circuit board layout and component packaging. Infinitesimal leakage current and capacitance between sections can affect performance. Because of this, Lynx always devotes a significant amount of time to PCB layout. Hilo's 8-layer circuit board incorporates multiple redundant ground planes and copper fill to guard against crosstalk and external noise. Every component and trace is meticulously positioned to minimize length and avoid parasitic affects. Surface mount components are used for tight component packing and to maintain close proximity of signals to ground planes.

HILO does not simply redefine and reengineer the two channel converter, it creates a whole new category.
*– Reference A/D D/A
Converter System*

## RETHINKING THE USER INTERFACE

Hilo was designed with audio performance in mind, but an easy to use and flexible control interface was also a significant design concern.
Rather than implement a front panel with fixed-function buttons, Hilo incorporates a 4.3 inch LCD touch screen as a user interface, which is a first for Hilo's product category. The screen provides control of all setup, routing, and metering functions. Since it is a software-based, the interface can evolve and be easily updated to support additional meter types, diagnostics, signal processing and measurement functions. The same interface is also available as a remote application running on a USB-connected computer.

HILO METERING OPTIONS
Hilo offers three distinct metering options. Retro-style VU Meters provide a visually appealing stereo meter set, selectable for any input or output pair. A pair of stereo Bar Meters are available, also selectable for input or output channels. The third meter page features mini-vertical meters of all 20 inputs and 28 outputs (not counting ADAT).
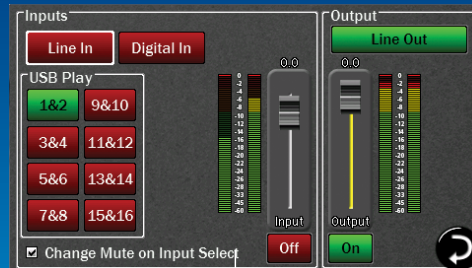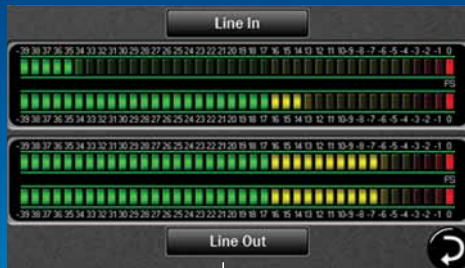
OUTPUT MIX ROUTING PAGE
This screen allows any analog or digital input to be muted or routed with a unique level to any output. Outputs can be muted

SUBMENUS
Context specific submenus allow quick selection of setting options

METERS BUTTON
Back to the selected meter

DISPLAY BUTTON
Controls and status for the LCD screen, including backlight %, auto dim

INFO BUTTON
Provides information on channel status, clock frequencies and battery level

TOOLS BUTTON
Resets default routing, system test, test tone and future features

HOME BUTTON
The screen pictured

Hilo

FEATURES

EXCEPTIONAL AUDIO SPECIFICATIONS

Hilo is Lynx's fourth generation converter and the product of thirty years of analog design experience. This experience, along with the latest components and design techniques result in stunning and verifiable specifications and audio quality.

MULTIPLE ANALOG OUTPUTS

The main Line outputs are supported by separate Monitor and Headphone outputs. Each output has a dedicated D/A converter to provide the best possible audio quality and the option of creating independent mixes. This is useful for vocal overdubbing, monitoring or pre- and post-effects mixing, and switching between monitors during mixing.

MULTIPLE DIGITAL OPTIONS

Hilo offers AES/EBU via standard XLR connectors. S/PDIF I/O is available via coax or optical connections. The optical I/O can also be used for 8 channels of ADAT I/O. Each digital output is an independent signal generated by the on-board 32 X 32 mixer.

LCD TOUCH SCREEN

The 480 x 272 LCD touch screen offers control, monitoring and diagnostic tools never before available on a converter. As Hilo is FPGA-based and field upgradable, new screens and future options will be offered via a simple download. The multifunction rotary control provides quick control of headphone and monitor volume as well as other contextual functions.

FUTURE I/O VERSATILITY

Hilo's LSlot expansion port accepts interface cards for a variety of protocols. As new I/O protocols come to market, Lynx will develop the interface options based on customer requests. All Lynx interfaces work with both Mac and PC platforms.

HIGH-SPEED USB 2.0 INTERFACE

The included LT-USB LSlot card provides 16 digital I/O channels via USB 2.0. The optional LT-HD card (for Pro Tools|HD®) incorporates up to 32 digital I/O channels.

ONBOARD 32 X 32 MIXER

A hardware based low-latency mix engine provides the ability to mix any or all inputs to any output and provide real-time level status.

Hilo can be powered by AC or optional DC battery pack

SPECIFICATIONS

Line In L/R
THD+N -114 dB @1kHz, -1dBFS, 20kHz filter, +22dBu trim
Dynamic Range 121 dB, A-weighted, -60dBFS signal method
Frequency Resp. ± 0.01 dB, 20 – 20kHz
Crosstalk -140 dB maximum @ 1kHz, -1dBFS signal
Full-scale trim settings: + 0dBV, +2dBV, +4dBV, +6dBV, +18dBu, +20dBu, +22dBu, +24dBu

Line Out L/R
THD+N -109 dB @1kHz, -1dBFS, 20kHz filter, +22dbu trim
Dynamic Range 121 dB, A- weighted, -60dBFS signal method
Frequency Resp. ± 0.02 dB, 20 – 20kHz
Crosstalk -135 dB maximum @ 1kHz, -1dBFS signal
Full-scale trim settings: + 0dBV, +2dBV, +4dBV, +6dBV, +18dBu, +20dBu, +22dBu, +24dBu

Monitor Out L/R
THD+N -107 dB @1kHz, -1dBFS, 20kHz filter, volume at max
Dynamic Range 121 dB, A- weighted, -60dBFS signal method
Frequency Resp. ± 0.02 dB, 20 – 20kHz
Crosstalk -130 dB maximum @ 1kHz, -1dBFS signal
Output level at max volume: +24dBu or +10dBu, jumper selectable
TRS connectors

Headphone Out
THD+N -107 dB @1kHz, -1dBFS, 20kHz filter, volume at max, 60Ω load
Dynamic Range 121 dB, A- weighted, -60dBFS signal method
Frequency Resp. ± 0.02 dB, 20 – 20kHz
Crosstalk -130 dB maximum @ 1kHz, -1dBFS signal
Output level at max volume: +19dBu

Digital I/O
AES/EBU: transformer-coupled on XLR connectors
S/PDIF I/O coax: transformer-coupled on RCA jacks
S/PDIF I/O optical: on optical connectors
ADAT I/O: 8 channels at 48 kHz when selected on optical connectors

Sample Rates
All standard rates up to 192 kHz using SynchroLock sample clock generator

Synchronization Sources
Internal
External word clock I/O: 75ohm TTL signal on BNC connectors
AES/EBU or S/PDIF inputs

Computer Connectivity
Windows 32-bit and 64-bit drivers provided by Lynx
Macintosh OS X drivers provided by Apple

LSlot™ Expansion Port
Supports Lynx LSlot expansion cards with up to 32 input and outputs simultaneously

LCD Display
480 x 272 LCD Touch Screen

Lynx STUDIO TECHNOLOGY