

# Radio World®

STUDIO SESSIONS

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PRODUCT EVALUATION

## LynxONE Improves PC Audio

I admit being disappointed by PC audio from early on. Fidelity issues aside, I've also been mildly persuaded into believing that the hostile innards of a computer would never be a respectable place for delicate analog audio signals.

But in the last few years, tremendous progress has been made. The LynxONE audio interface card from Lynx Studio Technology is one of the more notable achievements.

The LynxONE has 24-bit analog and digital audio XLR I/Os, dual MIDI ports and word clock in/out. For multitrack applications, up to four LynxONE cards can be strapped for sample-accurate clock synchronization.

In the digital domain, the I/O can be selected as AES/EBU or S/PDIF. Source and load impedances switch, as they should, between 110 and 75 ohms and are properly transformer coupled. Level and channel status bits also change as the standards dictate.

In the analog domain, the card does not require a consumer-to-pro adapter because the true balanced inputs and outputs operate at +4 dBu. The output will drive a 600-ohm load. Because the circuit is transformer-like, its level does not drop by 6 dB when connected in an unbalanced configuration.

Should you need to interface with semi-pro equipment, supplied software

can set the card to -10 dBV operation and a switched attenuator preserves signal-to-noise ratio. Because 16 dB of headroom is allowed, maximum output is +20 dBu or +6 dBV in +4 dBu and -10 dBV modes, respectively.

### Full-duplex

Additionally, this card is a full-duplex card, meaning it can record and play

ter- or eighth-inch phone jacks, two breakout cables transform bracket-mounted D connectors into studio connectors.

One cable, which is six feet in length, converts a 25-pin D connector into six XLRs for analog and digital audio inputs and outputs. A companion two-foot cable translates a 15-pin high-density D connector into four five-pin DINs for MIDI and two BNCs for clock signals.

### Installation

I have installed three cards — one at KZLA-FM where I work, another in a colleague's studio and one in my home PC. In all cases, the procedure for Windows 95/98 was simple.

A setup program is first run from a supplied floppy disk during which an installation wizard copies necessary driver files to the hard disk.

When the computer is restarted after installing the card, Windows will detect the card as new hardware and automatically configure it using the previously loaded software.

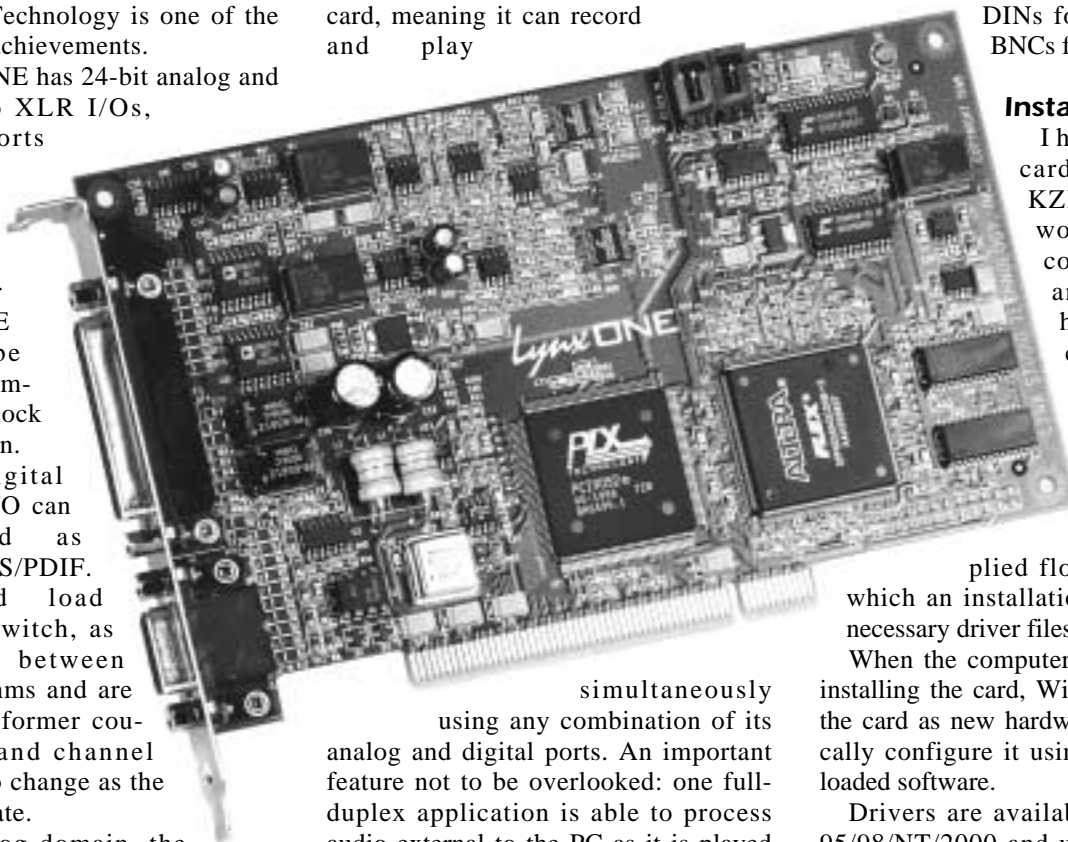
Drivers are available for Windows 95/98/NT/2000 and updated versions, including notes about revision history, can be downloaded from the company's Web site. An on-board green LED lights to signify when the board and driver have properly initialized.

Devices use Interrupt Request (IRQ) lines to send interrupts or requests for service to the micro-processor. As PCs have grown in complexity, available IRQs have dwindle

simultaneously using any combination of its analog and digital ports. An important feature not to be overlooked: one full-duplex application is able to process audio external to the PC as it is played and recorded on different tracks.

Because analog and digital I/Os operate independently, the card is actually a four-channel device. Using either an external A/D or D/A as appropriate, four channels of audio can be recorded and played at the same time.

Even though the half-size card supports 12 external connections, it occupies only one PCI slot. Rather than using quar-



dled. However, the LynxONE was designed with compatibility in mind.

In one PC, it shared an IRQ with a busy display adapter without any ill effects. And in two other PCs, the LynxONE cards coexisted with unremovable, integrated sound.

### The mixer

Although audio cards are intended to function quietly in the background, there are times when the card needs to assume a proactive posture and move into the foreground.

Once configured, an icon will appear in the system tray of the taskbar. Right-click on the icon and a pop-up menu of common parameter changes will appear. Double left-click instead and the LynxONE Mixer application will open (see Fig. 1).

Using this window, all aspects of the operation of the card can be controlled and monitored. Analog and digital I/O levels and channel balance can be adjusted. Each I/O can be muted and a color change shows which are active.

A 20-segment virtual LED displays indicate peak level from 0 to -96 dB. A choice can be made to monitor analog in, digital in, analog out or digital out, and assign the monitor source to the analog and digital outputs.

The sample clock can be set to four sources and reference to one of five options. Mixer settings are saved when Windows shuts down.

### Troubleshooting

The digital input status indicator can be

### Product Capsule: LynxONE Audio Interface Card

**Thumbs Up**

- ✓ 24 bits
- ✓ Balanced analog I/O on XLRs
- ✓ AES/EBU and S/PDIF digital I/O
- ✓ Four-channel full-duplex operation

**Thumbs Down**

- ✓ No online help
- ✓ No peak-hold meter function

For more information contact the company in California at (949) 515-8265 or visit the Web site at [www.lynxstudio.com](http://www.lynxstudio.com)

used as a general troubleshooting aid. It recognizes and displays *Pro* or *Con*, whether the digital input is professional, which is usually AES/EBU, or consumer, which is generally S/PDIF. It also will display mode — lock, which is usable; or unlock, which is not. The impedance, signal level and some status bits are different between Pro and Con settings.

Using a combination of codes and colors, the LynxONE will indicate if it is receiving audio data flagged as invalid or if the signal is unstable or has been degraded by long cables or poor connections.

The software can also identify violations of the biphasic encoding rules, signals that do not exhibit even parity and CRC channel status codes that do not match calculated values.

The converters automatically correct DC offset on startup but as the PC's operating temperature warms, they can drift slightly. A button to calibrate the converters allows the perfectionist to correct for any drift that may occur.

Bob Bauman, president of Lynx Studio Technology, explained that this function cannot be automated. There is a slight interruption to the audio when the converters calibrate, which would be undesirable during any period of recording or playback.

As impressive as the published specs are, I found them to be conservative in some respects. In other ways, the measurement equipment limited me.

Recording and playing back all test signals in CoolEditPro verified analog performance — these are not input to monitor output measurements.

With the card installed in a Dell GX1 PC, set for 44.1 kHz/24-bits, and a reference level of -1 dB FS, I measured ruler-flat response with gentle rolloffs at the band limits.

These limits are -0.07 dB left, -0.06 dB right at 20 Hz; and -0.23 dB left, -0.12 dB right @ 20 kHz.

THD+N measured 0.0029 percent @ 1 kHz with 22 Hz to 22 kHz bandwidth filtering.

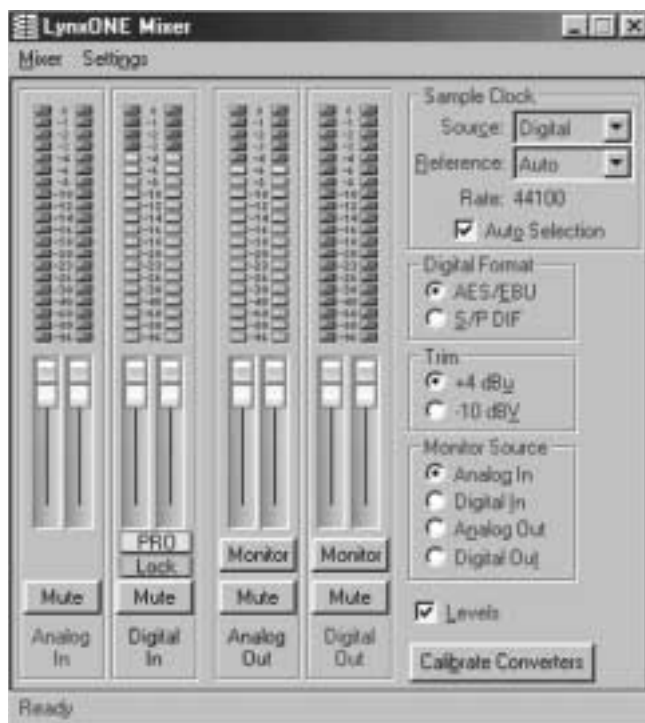


Fig. 1: The Mixer Screen

Signal-to-noise was better than 100 dB in a 22 Hz to 22 kHz bandwidth and greater than 99 dB A-weighted. Separation at 1 kHz measured better than 96 dB and inter-channel phase error was less than 0.4 degrees.

### Performance

Bauman said the analog support circuitry, professional-grade converters and a low-jitter clock source achieve this level of performance.

Despite simple and nearly automatic installation and detailed documentation, it is always comforting to know that competent assistance is readily available.

A qualified engineer answered my technical e-mail questions within 24 hours. And the reply was on target, thorough and complete. Phone support also is available.

Some PC peripherals can be finicky and plug-and-play does not always work as it should. But this audio card has performed flawlessly from installation through recording to playback.

Just like other audio gear, there are certain traits that distinguish and separate "semi-pro" devices from "pro." From the feature set to operating parameters to connectors, the LynxONE is in the pro category.



*Dennis Martin is chief engineer of KZLA-FM in Los Angeles. He is a member of SBE and AES, and has been an audiophile since the day he learned to spell it.*