Yamaha mLAN

Consolidate a fist full of cables into one Firewire lead? Sounds appealing. Scott Christie fleshes out what mLAN can mean for you.

Q uestion: What will a state-of-the-art studio in the year 2050 look like inside?
A nswer: I have no idea.

However, I will make one startling prediction: there will be a distinct lack of leads to trip over [Scott, while your at it, what’s in my tea leaves? – CH.]

Even the cosiest of today’s project studio setups comes with a bewildering array of cables, whether it be of the USB, SCSI, Midi or RCA/Phono/XLR variety. Innovations such as the ADAT Optical cable – capable of transferring eight tracks of digital audio down a cable the width of a piece of No.5 Barilla spaghetti – have been a step in the right direction, but this format only covers a small portion of the connections needed in a complete studio set-up.
The idea of having to reconfigure, trouble-shoot or (Allah forbid) move a typical studio and its wiring, are without question highly labour-intensive affairs.

You don’t therefore have to be a card-carrying member of the Hale-Bopp comet-cult to predict that somehow replacing all aforementioned signal formats with a single cable is a hot concept just waiting to happen. In fact, Yamaha (by way of Apple’s IEEE 1394 protocol) have devised just such a thing – it’s called mLAN.

Studio Networking
mLAN stands for Music Local Area Network. The ‘Local Area Network’ bit is taken from the world of PC networking, and applies to any small-scale networking of computer devices and peripherals: such as PCs, servers, printers and storage devices. When you apply this networking concept to a music studio you get a system of devices – such as synths, samplers, effects units, computers, mixing consoles, hard drives and CD/DVD burners – all interconnected via a common cable, all sharing common resources and moving data around sharing a common protocol.

In comparison, USB, SCSI and common digital audio protocols (e.g. AES, S/PDIF, ADAT Optical and TDIF) are what’s known as point-to-point protocols. In a point-to-point system the output of one device connects to the input of another – effectively ‘taking over’ these inputs and outputs to the exclusion of any other devices in the system. In a system such as this there is effectively no sharing of common resources. Point-to-point systems therefore come with their own enforced hierarchy, where the computer, for example, is the central ‘brain’ and all data transfers in the system are initiated from this central point.

mLAN on the other hand is a peer-to-peer technology where each device has equal status on the network and therefore doesn’t require a central host computer to manage and control the system. The benefit of a peer-to-peer system is that (just as in an office PC network) an individual can jump onto any device in the mLAN network (be it mixer, sampler or computer), and start moving data around. Furthermore, any number of users can be simultaneously on the studio network all sharing the same resources. [Actually, the upcoming ‘peer-to-pub’ network is the one that interests me – CH.]

mLAN also allows you to reconfigure the flow of data around your system without having to physically repatch or reconnect a single cable. New configurations can then be saved and stored as ‘user-presets’ for later use. The initial set-up of a system is also simplified by way of mLAN sockets making no distinction between input and output, thus making it easier to connect a system without specialist knowledge. mLAN devices can also be connected and disconnected without having to turn the
power off – otherwise known as hot-pluggable or hot-swappable.

**The Need for Speed**

While it may take a while to ponder just how mLAN’s networking functionality could redefine the way you work in a studio environment, it takes no time at all to ponder the benefits of mLAN’s ability to send and receive vast amounts of digital audio, Midi, timecode and hard drive communications down a single cable. The number one question asked at this point is just how much data can mLAN handle?

In terms of raw bandwidth, mLAN in its current guise is designed to run at 100, 200 and 400Mbps (megabits per second) with further provision to allow the data transfer rate to be expanded to 1.6Gbps (gigabits per second). As a means of comparison, the current Midi spec operates at a maximum 31.25 kbps; USB at 12Mbps; EIDE around 130Mbps; and Ultra Wide SCSI up 320Mbps.

At a speed of 200Mbps – which is the rate that current mLAN gear is designed for – mLAN is theoretically capable of handling around 100 channels of 16-bit/44.1k audio along with musical data equivalent to more than 256 Midi cables. However, when taking into account the network overhead of a large number of devices in a complex studio setup, these figures are somewhat reduced – so you may see various figures flying about as to mLAN’s exact bandwidth capabilities.

**Piecing Together the Puzzle**

For the purposes of getting to know mLAN a little better Yamaha provided me with a mLAN-enabled Yamaha CS6R synth and a mLAN8P (an unprepossessing looking little silver box that could probably best be described as a mLAN ‘breakout box’). The diagram at the bottom of this page shows the setup. Let’s first take a look at the hardware involved in this mLAN rig.

The first piece of hardware required to run mLAN is of course a computer equipped with a Firewire port (see ‘A Brief History of mLAN’ side box for more details on Firewire). On a Mac this means any model from the B&W G3/300 upwards (which come with built-in Firewire ports as standard) running OS8.6 or higher. On a PC this means any Pentium 133 or higher running Windows 95 or 98 that is equipped with a PCI Firewire card. The next bit of hardware in our system is the mLAN8P. The mLAN8P is Yamaha’s solution for enabling any mLAN-equipped device the ability to communicate with older or ‘legacy’ data protocols such as Midi, S/PDIF, Optical and good old analogue I/O. The grand vision is of course that one day all these legacy protocols will be redundant and that Firewire ports will be as common on products as a power socket – thus making the mLAN8P itself probably redundant. In the meantime the mLAN8P does the job of integrating the old with the new. In typical Yamaha style, the mLAN8P also contains a 12-channel, four-bus digital audio mixer with internal EQ, dynamics and effects DSP to boot – quite a powerful little box.

The final piece of required hardware is the mLAN8E expansion board. This provides the Yamaha CS6R synth with an mLAN interface. The board itself features three Firewire ports and a serial port for interfacing with PCs when running Yamaha’s mTools software (more on this later). The mLAN8E board is presently available only to a few Yamaha synths that have the appropriate expansion
facilities. Korg, however, have released a prototype rackmount version of their Triton synth that features their own mLAN interface.

In terms of software, mLAN requires the installation and configuration of three important components: OMS (Open Music System) to handle Midi I/O; the mLAN ASIO Driver to look after audio I/O; and Yamaha’s mTools software that consists of the mLAN Control Panel, the mLAN Mixer application and the mLAN Patch Bay application.

The mLAN Control Panel looks after parameters that apply globally to all applications working with mLAN, including sample rate, number of audio/Midi channels – rather confusingly referred to in mLAN-speak as ‘Sequences’ – and the scanning of the mLAN bus to detect all devices to transmit and receive data.

The mLAN Patch Bay is where you can configure all audio, Midi and word clock inputs/outputs in your mLAN setup. The Patch Bay is also where different mLAN data transfer configurations can be saved and recalled for later use. Finally, the mLAN Mixer application accesses the 12-channel mixer inside the mLAN6P, including its internal EQ, dynamics and effects processor.

**Spaghetti Junction to Fasta Pasta?**

Having discussed the components involved in running this particular mLAN rig, it’s time for a few observations. The actual setup and configuration of the mLAN system was, in my experience, quite a jigsaw puzzle. Splitting the configuration of the system among so many individual software components – including the frighteningly outdated OMS – certainly makes troubleshooting a headache. As soon as any complex physical system goes ‘virtual’ you really do need a single OMS-style graphic interface to make configuration as painless as possible.

It’s obviously early days, in terms of mLAN’s ‘plug and play’ integration with audio/Midi software, and the configuration issues convey this.

However, there has been talk of the tantalising possibility of integrating mLAN support directly into Mac OS X via Apple’s Sound Manager. This would provide multi-channel audio/Midi capability free of third-party drivers such as OMS and ASIO. This should allow for the development of a simplified and intuitive software interface to match the power and simplicity of the mLAN hardware. Should Windows and a few big names in the pro audio field follow suit, then we’re genuinely onto the ‘Next Big Thing’ in audio production.

**Distributed by**

- Yamaha Music Australia
  Phone: 1800 805413
  Web: www.yamaha.co.uk

**Price**

- mLAN8P: $2,995, mLAN8E: $1,445, CD8 mLAN: $1,145

---

**A Brief History of mLAN**

The mLAN story goes back a number of years when the engineers at Apple devised a new high-speed data transfer protocol to be integrated into the new range of G3/G4 desktop Macs. The protocol was christened Firewire and, in an inspired act of foresight, Apple placed Firewire into the public domain to encourage other manufacturers to incorporate it into their own technologies. It’s at this point that Firewire became what’s known as an international standard and was rechristened IEEE 1394. (Sanity has prevailed and the Firewire tag still remains in many of the product names you’ll encounter.)

Enter the DV (Digital Video) revolution – high quality video images from mind-bogglingly compact cameras at prices aimed fairly and squarely at the home consumer market. But how to get the vast amounts of data generated by these cameras into computers for editing and storage? Answer: Firewire. With this single ‘marriage of convenience’, high-speed data transfer ports were finally set to become a common component on the garden-variety PC. At the time of writing, Firewire now comes standard on all Macs from entry-level iMacs upwards. As far as PCs go, a quick web search discovered half-a-dozen manufacturers with highly affordable PCI Firewire cards on the market, including the FireConnect 4300 from the well-respected Adaptec.

The final chapter in the mLAN story comes with Yamaha seizing the opportunity to put the raw bandwidth of Firewire and its impending accessibility to good use in the world of audio production. Last year mLAN was unveiled, with demonstrations of 16 channels of audio and Midi being sent out of a G3 Firewire port to an 02R mixer and S80 synth – to general gasps of wonderment.

Following Apple’s lead, perhaps, Yamaha has released the original mLAN spec into the public domain and is on the way to becoming an international standard. Hence the propellorhead name IEC61883-6, otherwise more snappily known as the ‘Audio and Music Data Transmission Protocol for the IEEE 1394 medium’.

Silly names aside, the real question is will other audio manufacturers take up the Yamaha mLAN lead? As mentioned, Korg is now offering an mLAN interface on their Triton Rack, Swissonic are rolling out audio interfaces with a mLAN option, while Otari has also announced the adoption of mLAN in a number of future designs. But, AudioTechnology’s recent direct discussions with Roland’s CEO, Mr. Kakehashi, would suggest that a global take-up of mLAN is not a ‘given’ at all. While Roland and Yamaha are more than happy to team up when it comes to standardising General Midi (combining Yamaha’s XG and Roland’s GS), it would seem that Roland does not see mLAN being the way of the future, and has no plans to adopt mLAN in any of their forthcoming designs. Food for thought.