Beyond the MIDI 50 feet limit and it's applications with MIDI Extender products

In 1983 the introduction of a new digital communication standard for musical instruments called MIDI (Musical Instrument Digital Interface) allowed keyboards and other electronic musical equipment to synchronize and communicate with each other. This was an incredible breakthrough for musicians and if we look back at music history had a major impact on the way music was written, recorded and performed! The advent of MIDI shaped the sound of the radio airwaves in the 80's and in turn made the songs you hear on the radio and the performances of artists you see in concert possible!

In 2011 not much has changed except for trends in the style of music being recorded and performed, however MIDI still remains the core of the electronic musicians set up.

In its most basic use, MIDI can be used to trigger sounds from one electronic instrument to the next or to synchronize a sequencer and recording device.

Typical examples of "MIDI equipment" would be synthesizers; keyboard controllers, drum machines, sound modules, sequencers, and effects processors. Even guitar amplifiers tube and solid state commonly are equipped with MIDI giving guitarists the ability to switch multiple devices simultaneously like changing the channel of your amp and the effects processor presets, with the push of one button.

The MIDI protocol is not only limited to musical equipment but is also widely used in Theatrical lighting systems for concerts and shows and has many industrial applications that we are learning about everyday!

However the MIDI specification calls for a "maximum" cable length of just 50 feet, and when MIDI signals need to be distributed over "longer distances" such as in an arena, 50 ft can be a serious limitation!

With conventional MIDI cables any longer cable length could cause corrupted midi data or intermittent signals resulting in notes not triggering, sequencers not starting, channels not switching or missed or wrong notes being played or not during sequences, which, during a concert or performance could be a major disaster!

Well luckily there is a solution and today I'd like to introduce you to the MIDI extender product line from Lightway Inc., which consists of the MIDI-1001 and MIDI-2000. Both units will extend MIDI signals far beyond the "standard" 50 ft limit and are the answer to "error free long distance MIDI data distribution"!

If you've been searching for a way to run much longer "midi connections" with error free transmission then your in luck!

The MIDI-1001 extends your signals up to 1000 feet using standard CAT 5 cables without any interference or loss of data and the fiber optic MIDI-2000 will extend signals up to one mile or more, wow! Again without any interference or loss of data!

So how does it work?

Well without getting overly technical here's what's happening. The MIDI-1001 CAT5 system takes the standard MIDI current loop signals and converts them into carefully "balanced voltage signals". These signals are then conveyed between the various MIDI units by the interconnecting CAT 5 cable. This results in error free transmission over distances of up to 1000 feet.

How about the Fiber Optic based system?

Ok here the standard MIDI signals are converted into "pulses of light" which are then sent through fiber optic cable. Since the fiber optic cable is virtually immune to electrical interference, it can be routed wherever convenient without regard the proximity of electrical noise producers, water or high voltages. In addition since fiber optic cable is totally non-conducting, ground loops, which can result in loss or corruption of data, are virtually eliminated.

So when would you need longer MIDI connections?
There are many situations where you would need to have longer MIDI cables!

Below are a few common situations and uses for extending your MIDI signals.
From the recording studio to the stage, there are many possibilities and we are only just beginning to see the full potential of the Midi extender line.

MIDI Live on stage

Musicians on arena concert tours can now run midi equipment from off stage without the worries of cable length! Why would you need this? Well let's say your keyboard player's normal rig consists of a mountain of keyboards, modules computer gear and rack gadgets,

however you want to have a "sleek" looking stage without any extra equipment except for one or two controllers.

With the MIDI extender MIDI-1001 or 2000 it would easily be possible to set up his or her full rig back stage and just have one or two controllers on the stage triggering everything via MIDI.

What about triggering sequences and Pro tools tracks?

Same deal! Let's say your running sequences from a computer or Pro tools tracks and want to have the Pro Tools rig stationed off stage somewhere that's not in close proximity to you like back stage or at the front of house mixing console, you will definitely need more than 50 ft. With the MIDI extender products this is now a reality! As mentioned standard midi cables exceeding 50 ft could result in a loss of or corrupt midi data as well as poor midi timing and could possibly lead to a disaster right in the middle of a performance like a sequencer stopping mid-song, resulting in a silent stage!

As you are probably already aware, the live environment is also not computer-friendly: the gear on stage can experience extreme heat (lighting being the usual culprit), intense vibrations, dust, liquid spillages, and rough treatment. Synths and samplers are designed with these threats in mind — most computers are not. Add to that the transit risks and the ever-present possibility of a software crash, running your gear off stage sounds more attractive!

MIDI In the Studio

Let's say you're working at a professional recording studio and are in need of connecting or synching equipment via midi from adjacent studios. Or how about from a studio located upstairs or downstairs or even down the hall, you would definitely need more than 50 ft of cable and if you really wanted to wire everything professionally for more of a permanent set up, you would run the cables through the walls which would mean you would need even longer Midi cables!

A good example would be synching a pro tools rig or a computer sequencer to a multi track tape machine via a MIDI tape sync unit as well as keyboards and sound modules.

Recording System Synchronization

Or synching two DAWS such as Pro tools and Logic located in different locations via MIDI.

MIDI control for the Guitarist, Effects and amp channel switching

If you're a guitarist that uses midi equipment like a programmable midi foot controller for "simultaneous amp and effects channel switching", and or "real time control of effect parameters" such as filter frequency, wah wah, distortion drive, delay feedback, via an onboard expression pedal.

Now you don't have to worry anymore whether or not your midi cables will be long enough on the big stage to run from your pedal board or midi controller to your midi controlled amp or signal processor, as 1000ft should do the trick however with standard midi cables, 50 ft could be cutting it close.

MIDI controlled lighting
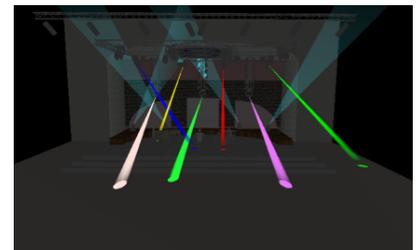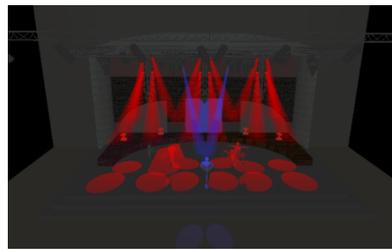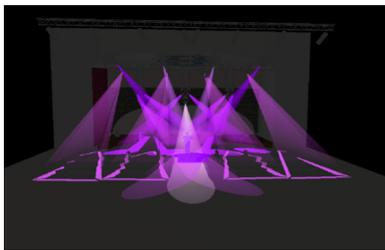

MIDI Show Control

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MIDI is a very popular communication standard in theatrical and concert lighting productions. MIDI can be used to send lighting cues manually or from a sequencer to synch an entire production via a lighting console. This is called MIDI Show Control. You may need to extend your MIDI "connection" between a sequencer or keyboard and lighting console depending on where each is located. What if your keyboardist is triggering lighting cues from the stage with a keyboard or your drummer has a drum solo and wants to trigger lighting cues manually from an electronic drum trigger, 50ft would be a serious limitation.

MIDI is also used as a control protocol in other applications such as:
- Show Control
- Special Effects
- Sound Design
- VJ-ing

An example of show control would be linking a video segment with a number of lighting cues.

The first show to fully utilize the MIDI Show Control specification was the Magic Kingdom Parade at Walt Disney World's Magic Kingdom in September 1991.

Eliminate your potential problem before it eliminates you!

MIDI extender product line is the answer to "error free long distance MIDI data transmission".

As designer Irwin Math has stated "even if you do not exceed the 50 foot limitation in a MIDI system the fact that copper wires carry the actual midi signal means that they can act as "antennas" and pick up interference in some "electrically noisy" installations that could also corrupt the midi data. This would be where a large factory or power plant is located near to where the concert is being held. Since the MIDI-2001 fiber optic system is totally immune to any interference pickup over the fiber optic cable it can easily solve this problem as well as send the midi signals up to 10 miles if needed."

"Many years ago when I worked in the theater there was a problem with interference pickup in the sound system. It seems that the Subway runs as close as 100 feet from some of the Broadway theaters and the interference coming from the contacts between the subway cars and the third rail was getting into the sound system and producing all kinds of static. The solution was double-shielded cables for the sound signals. If something like this happened in a MIDI system it could cause all kinds of missed notes or incorrect data."

The MIDI-1001 uses a balanced differential transmission scheme, which is immune to most forms of interference and assures reliable long distance transmission of all standard MIDI signals.

In those instances where even 1000 feet is not enough, or where there is severe electrical interference in the area where the MIDI or CAT5 cables must be run, the use of fiber optic transmission techniques can assure high quality noise-free signals. This technology is used by the MIDI-2000 system and can extend signals up to 1 mile.

Well I hope you've enjoyed this discussion on long distance MIDI and it's applications as well as the product overview and tutorial on the MIDI-1001 and 2000 systems from Lightway Inc. For more information and updates go to www.Midiextender.com.