Digital Snakes

By Bill Evans

How quickly things change. What once looked like a very defined market segment has kind of shattered. The best way to describe things now is more like "digital signal transfer." Some of the units below are stand-alone and meant to replace a traditional multi-core snake. Some are part of the workings of a specific console or family of consoles. And some kind of combine both approaches. The common link is that all of them will let you ditch hundreds of pounds of copper with any of these systems. FOH

Allen & Heath

iDR-32

The **iLive-T Digital Mixing System** includes a digital snake and consists of a control surface connected to a MixRack via a single Cat5E cable. Three different control surfaces are available, including the iLive R72, iLive-T80 and the iLive T-112, and there is a choice of four different remote MixRacks, the iDR-16 with 16 inputs and 8 outputs, iDR-32, iDR-48, and iDR-64 with 64 inputs and 32 outputs plus an optional xDR-16 expansion box. All MixRacks provide processing up to 64 inputs by 32 outputs, and all connect to the iLive-T's control surface with a digital snake using Allen & Heath's "ACE" network protocol.

ACE is an audio and control over Ethernet protocol which carries up to 64 channels bi-directional of digital audio plus full control in an extremely low latency Cat5E Ethernet cable. Two Mix engines may connect to a single surface for up to 128 discrete inputs. A single Cat5E cable can run up to 120m from the surface, a distance of nearly 400 feet.

Multitrack recording or digital splits (64 x 64) are available via MADI, ACE, EtherSound or the newly-released Dante option cards. Multiple splits can also be made (for example, FOH, Monitor, Broadcast, etc.), all with discrete DSP for independent mixes.

Pricing: R72 with IDR16, $12,999 (MSRP); T80 with IDR32, $16,999 (MSRP); T112 with IDR48, $21,998 (MSRP). In all iLive-T systems, the 64 input x 64 output digital snake is included.

ilive-digital.com

DiGiCo

All of **DiGiCo's** snakes are integral to the console packages but allow connection to MADI via coax, D-rack via Cat5E, Optocore Fiber Optics, Analog, AES/EBU, ADAT, TDIF, EtherSound and Aviom. There are many configurations that can be had and multiple Racks, I/O and sample rate options, depending on the size of the system. These come in packages of 9U or 10U, 19 inch rack mount, with up to 56 inputs and 56 outputs per rack that are interchangeable and have hot-swappable redundant PSUs. There is also an 8U system with a fixed 48 inputs and 24 interchangeable outputs and a 4U system with up to 32 inputs or outputs. All of these systems run MADI and have an auxiliary digital feed/split, and most have the option for Optocore. The final piece is a floor-mount D-Rack. This has 32 fixed inputs with up to 16 outputs per floor-mount stage box (which can also be rack mounted). This system uses Cat5E.

The smallest is 32 in and 8 out, and the largest is 698 in and 698 out, with sample rates of 48K, 96K and 192K with the new SD Rack. All systems are cross-compatible with the use of DiGiCo's LRB (Little Red Box) and/or LBB (Little Blue Box) and have Gain Tracking and mapping of inputs to outputs without the need for entering the console.

There is also the ability for an auxiliary feed to another console, alleviating the need for another digital snake mic pre amp, whether it is for monitors, live to air, or even recording to any DAW.

The cost of the smallest system, the SD9, is $26,999 (MSRP).

digico.org

LightViper Series 32

The **LightViper Series 32 VIS-1832 System** contains 32 mic/line inputs with a 3-position gain switch on each channel. A 32x8 VIS-1832 system can be configured using one VIS-1832 and one VIM-1832. A pair of VIM-MY32 cards (one master and one slave) may be used in place of each VIM-1832 in a system if using a Yamaha digital console with YGDAI card slots. In addition, you can add two splits to this system by adding two optical Tx-only devices to the VIS-1832, and using VIM-1032 units or VIM-MY32 cards at the tail end of these splits. The VIS-1832 can be rack mounted (5U) using the VER-1832 rack ear kit. All VIM units are 1U rack mount. The fiber "pass-thru" connector on any of the VIM units may be used to construct a distributed system, as opposed to, or in addition to, adding splits to the VIS-1832 stagebox. Larger systems can be achieved simply by doubling the number of units on the head/tail ends of the system. The I/O on the VIS-1832 is analog only. The I/O on the VIM-1832 is line level analog OR AES3 digital in, line level analog AND AES3 digital out. The I/O on the VIM-MY32 cards is fiber in/out only. The cable type for all systems is multimode or single-mode fiber-optic cable. The system can operate at 48k or 96k, internal or external clock. Systems using VIM-MY32 cards can operate at 48k ONLY. The VIS-1832 is convection-cooled while all VIM-1832/1032 units are fan-cooled. All devices in a system require AC power. The internal clock resides in the VIM-1832 or VIM-MY32M card. System configurations can be 32x8 with or without splits, 48x16 with or without splits, 96x24 with or without splits, and so on. A 32x8 system with one split retails for $9,180.00 (fiber-optic cable not included).

The **LightViper Series 32 VIS-4832 System** contains 32 AES3 digital inputs. A 32x8 VIS-4832 system can be achieved using one VIS-4832, 32 channels of mic pre's (i.e. Yamaha AD8HR) and one VIM-1832. A pair of VIM-MY32 cards (one master and one slave) may be used in place of the VIM-1832 if using a Yamaha digital console with YGDAI card slots. In addition, users can add two splits to this system by adding two optical transmit-only devices to the VIS-4832, using VIM-1032 devices or VIM-MY32 cards at the tail end of these splits. All VIM units are 1U rack mount units. The fiber "pass-thru" connector on any of the VIM units may be used to construct a distributed system, as opposed to, or in addition to, adding splits to the VIS-4832. Larger systems can be achieved by doubling the number of units on the head/tail ends of the system. The VIS-4832 is AES digital input only, AES OR digital out on the returns. The I/O on the VIM-1832 is line level analog OR AES3 digital in, analog AND AES3 digital out. The I/O on the VIM-MY32 cards is fiber in/out only. The cable type for all systems is multimode or single-mode fiber-optic cable. The system operates at 48k or 96k, internal or external clock. Systems using VIM-MY32 cards can operate at 48k ONLY.

The VIS-4832 system can also be used as a "drive snake," with outputs from a digital console feeding a VIS-4832 at FOH, and a VIM-1832 placed in proximity to the powered speakers (or amplifiers) using its analog OR digital outputs to feed these speakers (or amplifiers). A 32x8 system with 1 split retails for $7,505.

The VIS-4832 and all VIM-1832/1032 units are fan-cooled. All devices in a system require AC power. The internal clock resides in the VIM-1832 or VIM-MY32M master card.

lightviper.com

Link

DGlink is a multi-protocol enabled modular digital snake system. The DGlink digital audio distribution system leverages a long lineage of eurocable analog/digital cables, LK connectors, and digital circuitry (all manufactured by Link) which provides a modular digital distribution system compatible with the architecture of traditional stage boxes. DGlink is designed for live applications that require the integration and distribution of Analog, AES-EBU, and Ethernet-based protocols.

Link implements Dante into their DGlink Stage Box system. Audinate's Dante solution provides a plug-and-play digital audio network that uses standard Internet protocols. Dante is scalable and works on both 100Mbits and 1Gigabit Ethernet. Together with Link's hybrid approach, it offers the end user a distribution system that promises to improve audio quality and simplify setup. Modular configurations range from 32x16 to 64x64 channels; connections include Cat6, Cat5, Fiber, Eurocable Hybrid; mounting is standard 19"; and power is 110-240VAC, with redundant optional.

DGlink can support two simultaneous digital transport protocols and leverages Link's hybrid cables and connectors to provide a single touring grade cable and connection point between the front of house and the stage deck. DGlink can also be configured to integrate with pre-existing conventional stage boxes, sub snakes and splitters, which could help protect an investment in analog consoles and distribution systems. DGlink can also provide direct or transformer isolated analog inputs for conventional monitor and broadcast consoles. The optional DGlink AES-EBU drive module reclocks, rebuffers, splits and distributes 12 channels of AES-EBU digital audio throughout multiple amplifier racks. The DGlink system supports splitting and distributing can-bus protocols for remote monitoring and control, and DGlink provides an additional Cat6 connection for in ear monitoring or remote control of amplifiers and remote DSPs.

MSRPs: DGlink Ethersound: $11,702-$16,644, depending on number and type of inputs/outputs; DGlink Dante (48 digital inputs/16 digital returns): $13,075.

linkusa-inc.com

Midas Audio Distribution Systems

Midas Snakes have been created using I/O components developed for the Midas digital console range. They feature RFI protection, common mode rejection, dynamic range and overload tolerance. All components use a default unity gain structure, and analog inputs readily accept line level signals with headroom and metering identical to Midas analog consoles. The mic pre's are controlled by an application on the user's PC that provides direct access to 24 channels at a time, with all settings automatically stored to the snake hardware boxes so users can disconnect or reconnect the controlling PC at any time while the system continues to operate normally. Full metering is available for inputs (and outputs).

Models range from a 16 in/8 out system up to 64 in/64 out channels with up to 3,000 meters range, including a value-priced 48 in/16 out option. There is a choice of five hardware options including the DL431 24-channel, 5-way active digital/ analog input splitter. Each of its 24 inputs features three Midas mic pre's, which are isolated from each other to prevent any audio interaction. The DL351 64 channel and DL451 24 channel units support a range of five different I/O modules.

All the components are connected using standard Cat5e cables carrying the AES50 multichannel audio and control protocol, and all provide a standard 100m range. This can be extended up to 3,000 meters with the new Klark Teknik DN9650 network bridge in MADI mode.

Pricing is as follows: Fixed 48/16, $10,999 (MAP); Configurable 64 channel, $22,399 (MAP); Configurable 24 channel, $15,950 (MAP).

Optocore

SANE (Synchronous Audio Network plus Ethernet) is a network platform launched in 2009 that transmits MADI over Cat5 interconnection, yet still offers Optocore's ultra low system latency (41µsec.) and three way redundancy. It also supports all industry standard signal formats in an open platform.

Originally conceived in 1998, Optocore's use of fiber optics was the only solution due to practical requirements and available hardware. Recent advancements in RJ45 port speed and robustness have led to the ability to transport 64 channels of 24 Bit, synchronous audio, plus full 100Mbps standard Ethernet and word clock distribution over the same inexpensive cable.

Optocore's patented use of Time Division Multiplexing broadcasts a "snapshot" of data at each clock cycle, an improvement on asynchronous Ethernet based transport systems.

A single SANE network consists of up to 24 network devices placed up to 300 feet apart and locally transports 64 inputs. But just like Optocore, SANE only "considers" the inputs in use, so an almost-unlimited number of outputs are possible. Multiple SANE rings can be interconnected in a complete Cat5 topology or be created as a secondary subnetwork that branches off from a 24 node fiber-based widespread long distance Optocore prime network. SANE versions of Optocore network devices are practically identical, offering a variety of I/O cards that allow for 24 different versions but with multiple RJ45 ports. SANE devices work with all Optocore's Emulation Mode console manufacturers and with standard Optocore software.

SANE TP (Twisted Pair) option: $186 additional; SANE FX (Fiber) option: $1,527 additional (MSRP).

optocore.com

Roland

Roland's **S-1608** and **S-0816 Digital Snakes** are compact versions of the S-4000 Digital Snake System, with a fixed configuration that includes 16 inputs and 8 outputs and transports audio at 24-bit and 96 kHz with latency at .328 milliseconds point-to-point. Each channel has remotely-switchable phantom power as well as a 20 dB pad. The mic pre-amps are remotely-controllable in zipperless 1dB steps, using the S-4000R Remote Controller or PC using the free RSS-RCS software.

The S-1608 digital snake uses the REAC protocol, a low-latency digital audio transmission system over Ethernet cable. It can be integrated into any V-Mixer, including the M-400, M-380 and M-300. The S-1608 Digital Snake System is a small-format audio snake solution that can be floor-based or rack-mountable with rack ears. The S-1608 can be integrated with any digital console that is equipped with MADI by using the S-MADI REAC bridge.

The **S-4000 Digital Snake System** is an Ethernet-based modular digital snake system using the REAC digital audio transport protocol. Its standard configuration includes 32 inputs, 8 outputs and redundant Ethernet connectors and transports audio at 24-bit and 96 kHz with latency at .328 milliseconds point-to-point. Each channel has remotely-switchable phantom power and a 20 dB pad. The XR-1 mic preamps are remotely-controllable in zipperless 1dB steps using the S-4000R Remote Controller or PC using the free RSS-RCS software. The preamps have been designed for live sound applications and have 28 dB of headroom.

In addition to the standard 32 input, 8 output configuration, the S-4000 can be configured with any combination of inputs, outputs, or AES/EBU configurations in groups of four, up to 10 slots. All Roland Digital Snakes can be integrated with any MADI equipped digital console by integrating the S-MADI REAC bridge. The S-4000 digital snake can connect directly via Ethernet cable to any V-Mixer.

The redundant Neutrik Ethercon connectors can be configured as Main and Backup. In case the Main cable is compromised, the system will switch to the Backup cable and light an Indicator LED. The S-4000 also offers an optional redundant power supply. The S-4000S-3208 is rack mountable and provides flush or recessed mounting positions.

MSRPs: S-4000S-3208, $5,795; S-1608, $1,895; S-0816, $1,695.

rolandsystemsgroup.com

Yamaha

Yamaha SB168-ES

The **Yamaha DSP5D** is a stand-alone unit that expands the capabilities of the Yamaha PM5D digital console to 96 mono plus 16 stereo input channels, and includes two additional card slots with more effects and dynamics processing. The unit can be used with a PC and Yamaha Studio Manager software. When a PM5D is used in conjunction with the new DCU5D Ethernet Audio Cascade Unit and a DSP5D, the DSP5D can be set in a remote location and controlled from the PM5D up to 100 meters away using a Cat5e cable. A second DSP5D unit can be added to provide further expansion of up to 144 mono plus 24 stereo input channels. The rack mount DSP5D Expander unit is controlled via the master PM5D console, so no surface controls are required. Multiple units can be placed onstage, in an orchestra pit, or anywhere distance requires Ethernet audio cabling connectivity. The new DCU5D can connect 32-bus cascade ports of one or two PM5D digital consoles to the DSP5D using Ethernet audio, allowing for a connection of up to 100 meters between multiple DSP5D units. The DCU5D is configured from within the DSP5D and uses a single Ethernet cable. MSRP is $19,000.

The **Yamaha SB168-ES Stage Box** is scalable, offering 16 channels of remote-controlled analog mic/line inputs, each with its own head amp and eight line outputs, all at 48kHz. The SB168-ES can be used with the M7CL and LS9 digital consoles and also can be used and controlled by PM5D, DM1000, DM2000, O1V96 consoles and DME digital mixing engines. Up to four digital Stage Box units can be connected, offering a total of 64 inputs and 32 outputs, depending on the number of YGDAI card slots available on the specific console. The inputs and outputs can also be assigned to any of the 64 channels on an AuviTran ES-100 unit for EtherSound connectivity. The SB168-ES is ultra-noise resistant and helps minimize the length of microphone cables. MSRP: $4,499.

yamahaca.com

Whirlwind

Whirlwind ES3

The main components of the **Whirlwind E Snake** system are the E Snake Frame (ES3) and the E Snake 2 (ES2). Two or more of these units connected to each other or through an Ethernet switch (transport dependent) with Cat5 or fiber optic cables will replace the traditional analog multipair audio snake. E Snake currently supports CobraNet and EtherSound. Each ES3 or ES2 is a hardware frame that can be configured with input and output cards. Each card is capable of processing eight channels of audio. Input card choices include an electronically balanced mic/line card, a transformer isolated mic only card using Lundahl transformers and an AES/EBU card. Output cards include a mic/line card and an AES/EBU card. An ES3 can accept up to four input and four output cards, giving an ES3 the ability to simultaneously process up to 32 inputs and 32 outputs. An ES2 can accept any two I/O cards, and therefore process up to 16 inputs, 16 outputs or 8 of each. Multiple frames can be used to increase the capacity to hundreds of channels if required.

E Snake is also compatible with any Yamaha digital console or DME processor that supports MY16-CII CobraNet, MY16-ES64 or AVY16-ES EtherSound cards, making it easy to directly interface up to 96 digital channels (console dependent). Consoles with HA remote capability will have control over the gain and phantom of E Snake's mic pre's.

The plug-and-play **Connect Series** digital snakes each consist of transmitter and receiver boxes that can provide a 32x8 or 16x8 digital snake solution. They feature 32 or 16 analog inputs on stage to line level outputs at FOH and 8 analog returns from FOH to line-level outputs on stage via a single Cat5 cable. Multiple units can be ganged together to increase channel counts to up to 64x64 on a 100 BASE-T network or 640x640 on a Gigabit network. Additional receivers can be added to the system, providing digital splits to multiple locations. They use the CobraNet digital transport protocol and can interface directly with Yamaha digital consoles using MY16-CII cards or any other CobraNet compatible device. D Sub connectors on the rear are paralleled to the front panel XLRs and provide an analog split or an alternate method of connection. Gain and phantom power are manually controlled on the front panel — no computer is required.

The MSRP for Whirlwind's modular E Snake ranges from $4,495 for an ES2 with 16 channels of analog input to $9,995 for a fully-loaded 32x32 ES3 with its power supply. The Connect Series DS328T/R, a complete 32x8 system, has an MSRP of $7,995. The DS168T/R 16x8 system has an MSRP of $4,795.

whirlwindusa.com