

RME ADI-6432

MADI is a protocol that has been bubbling away on the back burner for some years making appearances predominantly on high-end hardware. Yet it offers an awful lot as a means of interconnection with only cost and a lack of conviction precluding wider acceptance. Things are changing as ROB JAMES finds with this MADI to AES convertor.



DESPITE THE FACT that a single, conventional AES3 link can carry two channels, the multicore cables required to transport high channel counts are still unwieldy, fragile and expensive. The Serial Multichannel Audio Digital Interface, to give it its full title, AKA AES10, promises long distance communications for up to 64 (extended mode) bi-directional channels over just two copper coaxial BNC or optical fibre cables. MADI is one of the legendary digital interface protocols, the only obstacle to wider acceptance has been cost. German manufacturer RME has set out to change that and has largely succeeded.

The UK£1787 (+VAT), 2u ADI-6432 format convertor is a recent addition to the growing RME Premier Line family of MADI devices. The basic functionality is 64 channels of bi-directional format conversion for MADI to and from AES-EBU at standard sample rates and 24-bits. Sample rates up to 192kHz are also supported with a commensurate reduction in the number of channels.

On the surface, the ADI-6432 is a simple device that does what it says on the rackmount enclosure. Silk-screened on the top, along with the usual safety and certification notices and a block diagram, is the legend, 'Quick Start Guide — Plug it in, Switch it on, Get MADI!' However, there is a lot more to it than that.

The MADI stream can also carry MIDI and serial data in both directions and the unit can be remote controlled by MIDI or RS232 serial data. To this end there are DIN MIDI sockets and a 9-pin D-sub.

The front panel has nine buttons with 31 associated LEDs and a further 97 indicator LEDs in the main status display matrix. Three rows of 32 LEDs show the Sync and Audio state of each AES stereo channel and Audio state on each MADI channel pair. A single LED shows MADI sync status.

MADI Input determines optical/coaxial. The State section shows Error, 64-channel mode and 96k

frame format. AES Input displays the basic state of the AES input signal: Error, Double Speed and Quad Speed. Word Input displays the state of the Word clock input signal when Word is chosen as clock reference: Error, Double Speed and Quad Speed. The clock reference and frequency multiplier is chosen in the Clock section. MADI Output configures the MADI output as 56/64 channel or 48k/96k frame format. Remote selects the MIDI remote control source (MADI or DIN jack). MIDI Input indicates received MIDI data. Com indicates serial data being received or transmitted via the 9-pin connector. Lock Keys does what it says and all settings are retained when the unit is switched off.

AES connections are on eight 25-pin D-sub connectors in Tascam format, i.e. four stereo inputs and outputs per connector. Both coaxial (BNC) copper and glass optical (SC) MADI connections are provided. Copper can span distances up to 100m while multimode optical can span around 2000m. If the distance between units is less than 100m both coaxial and optical connections can be used to give redundancy, auto switching if an input is lost.

The original MADI specification supported a maximum of 56 audio channels and this was officially extended to 64 in 2001. However, some modern devices still only allow 56 audio channels, reserving the remainder for control commands, etc. The ADI-6432 supports the full 64 audio channel plus 16 MIDI channels and an RS232 stream by making use of some of the user bits. A Windows applet can be freely downloaded from the RME website that gives remote control and status requests of the ADI-6432. When used with an HDSP MADI (PCI card) as I did, this offers direct control via MADI.

MADI, like AES is a self-clocked format, i.e. no separate sync connection is required. However, the usual strictures apply, there can only be one clock master in a complete system. The ADI-6432 can be

master or can sync to Word clock at single, double or quad speed on the AES or MADI inputs. The lowest numbered channel with a valid signal is used as the source.

RME uses a number of techniques to improve lock and jitter performance. SteadyClock is its answer to often heavily jittery MADI data signals but it also deals with jitter present on other sync sources. The cleaned up clock signal is also available at the Word clock output. SyncCheck assesses all the inputs for synchronicity. If an asynchronous input is detected the associated sync LED flashes. SyncAlign avoids the random 1 sample error between AES stereo pairs.

Apart from the obvious application — breaking out the I-O of MADI-equipped devices to AES — a pair of units makes a compelling alternative to multicore for live applications. Leaving aside the cost advantages of a pair of optical cables over multicore copper, galvanic isolation confers valuable safety benefits. In addition, many sound reinforcement devices such as amplifiers and crossovers can be remote controlled using the serial communication in the MADI stream.

Some equipment manufacturers only support certain flavours of MADI. The ADI-6432 is the MADI equivalent of superglue. It can accept any legal input format and output it in 56 or 64-channel modes. In 96kHz frame it can also convert double-wire MADI to single-wire double-speed. The unit can also be used as an AES inserter into a MADI stream. Channels to be forwarded are simply bridged by connecting AES outputs to inputs, while channels to be modified or added are broken out. Similarly, a pair of units can be used to merge two MADI streams.

Any format conversion process is likely to introduce latency and this is no exception. The good news is that here it is tiny — five samples at 48kHz when playing back and rerecording and the unit signals its own latency to DAW applications.

RME has quietly established itself as one of the foremost manufacturers of professional DAW I-O interfaces and convertors. I've always been a fan of optical interconnects and MADI can be seen as a kind of 'super ADAT TOSlink' for professionals. Thanks to RME it will now often prove to be the most cost-effective and safe option when all factors are properly taken into account. The ADI-6432 most usefully extends the Premier Line and will find customers across the industry. ■

PROS Elegantly achieves what it sets out to do; cost-effective when high channel counts are required; simple and versatile.

CONS Not much really; adaptors needed for Yamaha and other AES Sub-D pin-outs; single wire AES only.

Contact

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