





## M-MADI FAQ

Q: What type of cable do I use with M-MADI and how far can it run?

A: Non-optical MADI systems use 75ohm Coaxial (video) cable terminated with BNC connectors. We tested M-MADI with typical industry cable (Belden 1505A) with 'Amphenol' BNC connectors. We recommend the cables are professionally crimped using the correct tooling. When connecting two pieces of A&H MADI equipment, cable reach is extended from the standard 50m up to 150m with good quality cable. The key to this feature is the receiver circuit in the MADI Option Card, so both ends of a MADI link must be A&H in order to achieve this distance. If audio is only being transmitted to an A&H MADI card, with no audio being returned, cable length may also be extended. An RME MADI card transmitting audio to an A&H MADI card will work at 150m. *Distances of between 150 and 300m will also work, but as MADI dictates that transformer isolation is not used, these longer distances require the use of a mains filter or 'cleaner' for each device, if the link is to remain error free during high-voltage mains-line transients. Correct operation has been verified at 300m.*

Treat coax cables with respect. Unlike touring-grade CAT5e cables, they are constructed using a solid core, which will break after repeated bending. Ruggedised coax is available from manufacturers such as Belden, but this can be very expensive. See [www.allen-heath.com](http://www.allen-heath.com) for cable recommendations.

Q: What sync options do I have with M-MADI and iLive/GLD?

A: Users can choose to take audio sync from the MADI Option Card. The normal 'clock source' drop-down on the touch screen or Editor program will show 'MixRack remote B' (iLive) or 'I/O Module' (GLD), when fitted. M-MADI configuration panel has its own drop-down, for selecting to sync from either Link 1, Link 2, or Wordclock IN (useful in GLD and iLive fixed format systems where external sync connections are not provided as standard). This selects which clock source is given to the system by the card.

The option to sync from the MADI stream in the mixer configuration page when a MADI Option Card is fitted is provided for convenience, and is not part of the MADI spec. There should not be a problem with using this option, but it is outside of the spec.

When connecting Link 1 and Link 2 to two different devices, these devices must be in sync with each other, and with the iLive or GLD. This can be achieved using a distributed word clock signal, or by syncing both devices from the MADI stream (i.e. from the MixRack), if they provide this option. Making use of the Aux BNC as an additional word clock output can be useful here.

When using redundant mode, choosing either 'Link 1' or 'Link 2' sync merely sets the preferred input to sync from. If one link has failed, the other will be switched to automatically.

Be careful with the AUX BNC. If the port is set to be a word clock output, and is connected to a MADI device from a 3<sup>rd</sup> party, the large output swing of the word clock could in theory damage the MADI device. For this reason, the default setting for the AUX BNC is 'Link 1 through'; this mode cannot damage anything.

When in non-redundant mode, altering the input routing may produce clicks or pops on the channels being switched. Changing this routing live is not recommended.

Using an RME MADI card as the system clock master is possible. Make sure the RME MADI card 'Clock Mode' is set to 'Master', and that the frequency is set within the system lock range (which varies depending on whether VCO mode has been activated or not). The simplest sync method is then to set the A&H MADI card 'Sync Source' to 'Link 1', then set the 'Audio Clock Source' to 'Mix Rack Remote B' (iLive) or 'I/O Module' (GLD).

An alternative is to connect the RME card WordClock Out to the A&H MADI card Aux BNC, set the 'Mix Rack Aux BNC' to 'Word Clock In', set the 'Audio Clock Source' to 'Mix Rack Remote B' (iLive) or 'I/O Module' (GLD), then set MADI card 'Sync Source' to 'WordClock Input'.

Word clock source termination can be bypassed by moving the jumper fitted to CN6 from pins 1-2 to pins 2-3. This could be required when the Aux BNC is set to output WordClock, and the receiving device is an older device using a standard CMOS input stage. If a particular receiving device is not locking to the WordClock output, the first thing to try is to see if there is a 'term' switch on the receiving device, and turn it off. If this does not work, try moving the MADI card jumper as described.

Q: iLive modular Surfaces can use the RAB2 audio system, this has two slots for options. Which can I use for MADI?

A: Port-A is used for the Surface-MixRack link. The only card supported in current firmware, that can be fitted to surface Port-B is M-MMO. Typically M-MADI could be used for the iLive Surface to MixRack link and users may want to take advantage of the redundancy mode, where a second set of cables (send and return) are connected to Link 2.

Q: Can I do recording from an iLive Surface M-MADI?

A: 32 channels in the MADI link are used for the I/O at the surface, plus others are used for PAFL and TB. However, channels 33-62 are freely configurable in the Port-A tab on the touch-screen OUTPUTS page and Editor software. The M-MADI Aux BNC can be set to 'repeat' what is coming in on Link 1. This way the AUX out can be used for recording at the surface location.

*NB If not using redundant mode for a surface link, Link 2 on the surface port-A should not really be connected to anything. Its out port will be transmitting the signals coming into any input cards fitted to the surface (channels 1-32), and the talkback mic signal (channel 63). Other channels will be silent. Since the 'input routing' in this case is forced to 'all link 1', its in port discards any stream connected to it.*

Q: Can M-MADI be used with 56 channel systems?

A: The MADI card always transmits 64 channels. It can receive streams containing any number of channels up to 64. If the MADI stream being provided to the card stops transmitting channels (i.e. it switches from a 64 channel mode to a 56 channel mode without interrupting the stream), the system will see a constant DC level on these channels, until the cable connected to the 'IN' socket is disconnected, or the system is reset. This is the case with an RME MADI card; switching from 64- to 56-channel mode with audio being received by the A&H MADI card on channels 57-64 will leave a DC level on these signals. Switching from 56- to 64-channel mode works without issue.

Q: Any tips about connecting multiple MADI devices?

A: Daisy chaining A&H MADI devices using 'T' connectors so that two or three cards receive the same channels should work when using shorter cables, but should be discouraged. Users wishing to do this should perform their own experiments to make sure they are happy with the reliability of the system. A much better solution is to utilise the AUX BNC, and set its mode to 'IN1 Through'; this allows 150m runs between devices.

A&H MADI card uses fully differential AC-Coupled inputs. This allows the system to operate with ground differences between connected units, or, from another perspective, provides better fault tolerance in systems where there is a good common ground. This also means that it is not possible to form a ground loop with a MADI cable.

Q: Which version of iLive / GLD firmware do I need before using M-MADI?

A: iLive firmware V1.53 or higher, GLD firmware V1.0 or higher. Note that some options are only enabled on GLD firmware V1.1 or higher.

Q: Does M-MADI work with RME and other third party devices?

A: Yes, we have tested M-MADI and it works well with RME devices, however we recommend you update RME devices to the latest version of firmware. We have customers who have happily used M-MADI with Digico 56-channel MADI streams. M-MADI can provide multi-channel I/O via SSL or Avid interfaces to ProTools.