ALLEN & HEATH RECOMMENDED CABLES
A BUYING GUIDE TO CABLE TYPES FOR AUDIO AND CONTROL

Different cables are used with our mixers depending on the control and audio interface options fitted. The choice of cable and connector type is important in ensuring it is suitably reliable and rugged for the application, does not degrade system performance and meets the associated EMC standards requirements. Cable type becomes critical for longer distances and touring applications.

The cable is the link between major components in the system and its importance should not be underestimated when specifying type and construction. The following notes provide a guide to recommended types.

Different protocols, different bandwidth

Allen & Heath's protocols rely on standard Layer 2 Ethernet to transport audio between nodes.

dSnake, ME, ACE and DX links use 100BaseT Fast Ethernet, with 99.7% of bandwidth use. gigaACE uses 1000BaseT Gigabit Ethernet, with 93% bandwidth use. S-link ports auto negotiate protocol and link speed, switching to dSnake, ME, DX or gigACE mode depending on the connected device.

For a deeper understanding of these protocols, please refer to our white paper 'A case for proprietary Audio-over-Ethernet protocols', available on our website here: https://www.allen-heath.com/media/DX-gigaACE-white-paper-1.pdf

CAT cables and connectors

Use STP (shielded twisted pair) CAT5e or higher cables. Those with both foil and braided screens provide shielding from interference and are generally more rugged.

Although solid core types can perform better at longer distances, stranded core cables are less prone to damage when kinked or repeatedly coiled. If you use a solid core type for touring check with the manufacturer that it is rated for the touring application. Solid core is preferable for permanent installation, whenever possible.

CCA vs Pure Copper

Copper Clad Aluminium cables use an aluminium conductor that is coated with copper. The resistance of aluminium is much higher than copper, resulting in a greater attenuation of the signal. This might result in packet losses, which often manifest as 'clicks' in audio signal. The mechanical strain of aluminium against copper is much lower, resulting in shorter lifespan of cables under stress.

Straight vs crossed

All Network, ACE, gigaACE, DX, dSnake and S-Link ports are 'auto-switching' so both straight and cross-over CAT cables can be used for these connections.

ALLEN&HEATH®

ALLEN & HEATH LIMITED, KERNICK INDUSTRIAL ESTATE,
PENRYN, CORNWALL, TR10 9LU, UNITED KINGDOM.
www.allen-heath.com

Connectors

For long distance cables and those that are repeatedly plugged/unplugged, we recommend you use Neutrik EtherCon connectors. These have a shell that protects the connection and locks it in place when plugged into the mating EtherCon socket provided on our equipment. Protective dust caps are available for these connectors.

Use only Neutrik NE8MC EtherCon or compatible connectors. The Neutrik NE8MC6 range is NOT mechanically compatible with the EtherCon socket on our products. For CAT6 termination use the NE8MX6 range instead.

The following CAT5 cable types have been tested and approved by Allen & Heath to meet the required EMC standards:

Manufacturer	Part no	Cable type	Comments
Lapp Kabel	Etherline P flex 2170300	Stranded with a foil & braided screen	Available in USA
Klotz	RC5 RAMCAT5-flex	Stranded with a braided screen	
Proplex	PCCAT5EP	Stranded with a foil & braided screen	Available in USA
Klotz	RC5SBSW	Solid with a foil & braided screen	
Draka	Etherflex	Stranded with a foil & braided screen	

Allen & Heath can provide a range of pre-assembled, approved CAT and fibre cables. Please see here for more information: http://www.allen-heath.com/ahproducts/cat5/

fibreACE

The fibreACE card provides Neutrik OpticalCon sockets for the fibre link. OpticalCon uses a rugged housing around standard LC connections and is therefore backward compatible with LC. In a fixed installation, standard LC connectors can be used instead

We recommend the use of OM3 MultiMode optical cables up to 550m (1804 ft). OM4 can be used as well.

IP controllers

The IP range of controllers utilise standard Layer 3 Ethernet. For cabling purposes, it can be addressed as any computer or node on a network.

Standard Cat5e or higher can be used. When supplying PoE power, note that IP1 and IP6 use PoE IEEE 802.3af, whereas IP8 requires PoE+ IEEE 802.3at.s.

ALLEN&HEATH®

Dante

Dante is an Ethernet Layer 3 compliant audio networking solution created and developed by Audinate.

As most Dante devices support Gigabit Ethernet, CAT5e or CAT6 cables are recommended.

Please refer to www.audinate.com for further information.

Good practices on Ethernet switches and network design can be found at https://audinate.com/resources/networks-switches.

Waves SoundGrid

SoundGrid is an Audio-over-Ethernet networking and processing technology developed by Waves Audio.

Cat6 STP cables are recommended for Waves SoundGrid systems. Information on cable types and cable lengths is available here:
https://www.waves.com/support/ethernet-cables-for-soundgrid-systems

MADI

MADI is an industry standard multi channel digital audio protocol specified by the Audio Engineering Society as AES10.

A MADI option card is available for dLIVE providing a convenient interface for recording and integration with third party systems.

The card supports up to 128 channels of audio at 48khz or 64 channels of audio at 96khz over 75 ohm coaxial cable, plus 4 SFP slots for fibre optic modules of the desired mode and frequency.

Typically, two coaxial cables are required for each link, one for each direction. The MADI standard supports up to 50 metres (165 feet) but if audio is being transmitted from a third-party device to an Allen & Heath MADI card, with no audio being returned, or being transmitted both ways between two A&H cards, then the cable length may be extended. For example, an RME MADI card transmitting audio to an Allen & Heath MADI card can work up to 150 meters (500 feet). Longer lengths may be achieved but this requires the use of a mains filter for each device if the link is to remain error free during high voltage mains interference.

Note that it is important that good quality BNC connectors are used and that they are correctly crimped to the cable. For this reason, it is best to buy pre-assembled cables rather than attempt to make your own. Note also that you should avoid kinking these cables or coiling them with tight loops as this may cause damage.

Allen & Heath have tested and recommend the Belden 1505A 75 ohm coaxial cable for use with MADI.

The recommended cable specification for installations is RG59U (note that this is NOT the same specification as the USA RG59B standard):

Impedance	75ohm
Diameter	6.1mm
Capacitance	68pF/m
Loss	12dB@100MHz/100m
	18dB@200MHz/100m

For further information, application guides, and recommended products please visit https://www.allen-heath.com/installation/

ALLEN&HEATH®

ALLEN & HEATH LIMITED, KERNICK INDUSTRIAL ESTATE,
PENRYN, CORNWALL, TR10 9LU, UNITED KINGDOM.
www.allen-heath.com