HDMI and HDBaseT Cabling Guide

Contents

Control4

HDMI

Type

High-speed HDMI cables with a length no more than nine feet (three meters) should be used. Recommended cable brands include:

- AudioQuest
- Monster HDMI cables
- Rocketfish HDMI cables

Layout

Avoid unnecessary coils, loops, and bundling of excess cable. Choose a cable length appropriate for the installation without unnecessary additional length.

Keep separation between HDMI cables and power cables. Also keep cables away from other known sources of interference.

Attachment

The following guidelines are supplied in regards to cable attachment and mounting:

- Cables are recommended to be fixed with Velcro tape. Do not use cable ties, which may damage the cables. Also avoid tie-wraps.
- Cables are to be routed, supported, and fixed in such a way as to prevent any possibility of cable crushing, kinking, and stretching.
- Cabling should not be subjected to any bends or change of direction with a bend radius of less than 10 times the outside diameter of the cable.

Patch panels, joiners, and wall plates

Patch panels, joiners, and wall plates with patch leads (discontinuities) are not recommended, because they will reduce performance.

HDBaseT

Type

Shielded S/FTP CAT6a or CAT7 cable rated above 500 MHz is recommend for maximum performance. Standard CAT5e/6 cables may be used but are not preferred, because they may reduce performance.

> **Caution:** In lightning-prone areas, *shielded* and *grounded* CAT6 (or better) cable *must be used*. See more details under "Termination" below.

Cable length depends on the device's HDBaseT class and should be no longer than the following:

Full	CAT5e/CAT6	CAT6a/CAT7
High definition (1080p 60)	328 feet (100 m)	328 feet (100 m)
Ultra High definition (4K2K 30)	230 feet (70 m)	328 feet (100 m)
Lite	CAT5e/CAT6	CAT6a/CAT7
High definition (1080p 60)	197 feet (60 m)	230 feet (70 m)
Ultra High definition (4K2K 30)	115 feet (35 m)	131 feet (40 m)

Table 1: Maximum cable lengths. Assumes ideal run layout.

Termination

All HDBaseT cable runs are to be terminated at both ends according to the same standard (either T-568B or T-568A). Any termination wiring must be as short as possible with equal length pairs that are twisted close to the connector. It is recommended to terminate cables such that excess cable length is eliminated, thus avoiding turns and corners that may degrade signal quality.

We strongly recommend terminating the shielded S/FTP CAT cable using shielded connectors at both ends. This is particularly important in lighting-prone areas. Properly grounded and shielded category cable can significantly reduce the likelihood of issues that commonly arise from lighting strikes.

Note, however, that some installation locations may have poor electrical earthing (grounding). This is more commonly the case with older construction. In such cases, it may be preferable to terminate the HDBaseT cable shield with only a shielded RJ45 connector at the switch end of the cable, and not have the cable shield connected to the RJ45 connector at the HDBaseT Receiver end of the cable. Consult with a licensed electrician for further details.

Layout

Cables should be separated from all other cables for the entire length by a distance greater than 10 mm except in the following case: When in a 164 foot (50 m) end-to-end run, multiple cables may be bunched for a maximum length of 33 feet (10 m). For the remaining length, the CAT cables must be separated from all other cables by a distance greater than 0.4″ (10 mm). (This requirement is supplementary to those specified in ACA/ACIF S009.)

Additionally, cable should not be bundled or coiled. It is recommended to stretch a cable to its full length between the HDBaseT transmitter and receiver devices. Superfluous rolls of excess cable will degrade the performance and should be avoided. Note that the maximum lengths will be reduced when cable is coiled.

Attachment

The following guidelines are supplied in regards to cable attachment and mounting:

- Cables are recommended to be fixed with Velcro tape. Do not use cable ties, which may damage the cables. Also avoid tie-wraps.
- Cables are to be routed, supported, and fixed in such a way as to prevent any possibility of cable crushing, kinking, and or stretching.
- Cabling should not to be subjected to any bends or change of direction with a bend radius of less than 10 times the outside diameter of the cable.
- Do not "comb" or "pinstripe" cables in the first 66 feet (20 m).
- Separate path and equipment cords in the first 66 feet (20 m).
- Use horizontal wire management techniques (for example, route odd ports to upper management and even ports to lower management).
- Loosely place cables in vertical wire management.
- Reduce maximum conduit fill density to 40%.

Patch panels, joiners, and wall plates

Patch panels, joiners, and wall plates with patch leads (discontinuities) are not recommended, because they will reduce performance. However, if patch leads cannot be avoided:

- Wall plates, joiners, patch panels, and leads must be CAT6/6a/7 rated
- Use no more than two patch cables resulting in a three-segment installation as illustrated. Each patch lead must be no more than 16 feet (5 m), and the total length of all three segments combined must be under those specified in Table 1.

| Transmitter | Patch1 | Main Cat | Patch2 | Receiver |
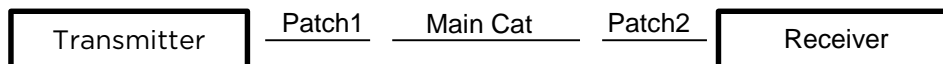
Troubleshooting

Cable analyzers (such as Fluke DTX1800) can be used to verify cable performance and length.

The LU Series of products have the capability to report the approximate link quality, which may be used to identify potential cabling issues (refer to *4K Ultra HD LU Series Setup Guide*).

Document information