



## General Guideline for cabling of Gefen CAT5/CAT6 Extenders for :

### VGA, Composite and Component Video, DVI and HDMI

All cables should be installation type, solid core type. AWG23 is preferred, AWG24 is acceptable. Cables with lower cross section are too lossy and will lead to reduced extension range, especially with DVI/HDMI Extenders.

For solid core cabling appropriate RJ-45 connectors have to be used because standard RJ-45 connectors are designed to terminate stranded wires. With solid core wires (especially those of higher cross section) termination can be insufficient and lead to no or bad transmission. Those connectors are specified for solid core cabling by the manufacturer. For instance:

Manufacturer: **Phoenix Contact**, „**VARIOSUB-RJ45 Quickon IP20**“, Type: VS-08-RJ45-5-Q/IP20, certified to CAT5 and CAT5e.



or

Manufacturer: **Telegaertner**, „**STX IP20 Field Plug RJ45 J80026A0003**“ (same as BTR, E-DAT Industry IP20 RJ45 field plug black). Certified for Cat6A ANSI/TIA/EIA-568-B.2-10



Manufacturer: **Telegaertner**, „**MFP8 T568B Cat.6A J00026A2001**“, certified for Cat.6A ANSI/TIA/EIA-568-B.2-10).





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### Twisted-pair cable standards:

**CAT5e cable:** 4-pair,UTP (U/UTP), AWG23, specified to be in accordance with TIA/EIA-568-B.  $f_{min.}=100\text{MHz}$ , for 100BASE-T und 1000BASE-T Ethernet. Class D (ISO/IEC 11801:2002 or EN 50173-1:2002).

→ Good for VGA, Composite and Component Video (When low Skew cable is used), also good for 1080i/720p when used with DVI and HDMI CAT5-MS Extenders. Good for ELR based Extenders for shorter ranges.

**CAT6 cable:** 4-pair,UTP (U/UTP), AWG23 specified to be in accordance with TIA/EIA-568-B2.1 (EN50288 ),  $f_{min.}=250\text{MHz}$ , (ISO/IEC Class E), Suggestion: Belden Gigaflex 4800LX Series, Belden Datatwist 1351A, Leoni-Kerpen Megaline E2-30 U/U 4P, DRAKA UC400 23 Cat.6 U/UTP or Dätwyler uninet 662 4P U/UTP Cat.6 AWG24

→ Good for VGA, Composite and Component Video (When low Skew cable is used), **preferred** for 1080p when used with DVI and HDMI CAT5-MS, ELR and 3DTV Extenders.

**CAT6e or CAT6a:** Are no recognized standards! The "e" and "a" indices are just brand related and don't allow any comparison to recognized standards.

→ avoid when possible, Can be compared to CAT5e or CAT6.

**CAT6A cable:** according to EIA/TIA-568B.2-10 Draft 5.0,  $f_{min.}=500\text{MHz}$ , Transmission class E<sub>A</sub>, AWG23, UTP (U/UTP). Suggestion: Belden 10GX12, DRAKA UC500 23 U/UTP Cat.6a LSHF, Brand-Rex 10GPlus AC6U-HF1, Nexans LANmark-6A F1/UTP N100.62xG.

→ Mandatory for HDMI1.3- and DVI-1CAT6 Extenders, Good for VGA, Composite and Component Video (When low Skew cable is used), also good for 1080p when used with all DVI and HDMI Extenders

**CAT7 cable is NOT recommended** as it is not EIA/TIA recognized standard! It is meant and widely spread in Europe as a generic installation cable for Network, ISDN, Cable TV and POTS. CAT7 it is too tightly twisted, has too high Skew, too high signal attenuation and bad SWR for the use with Extenders.



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### **General information about installation, cable handling and termination:**

All CAT cables for Gefen extenders have to be terminated according to TIA/EIA-568B as they are adapted to the different twists of the pairs in the CAT cable.

With DVI and HDMI Extenders the wiring between Sender and Receiver has to be direct 1:1 without any splices, Patch bays, push-down terminals and so on.

The signal transmission is completely different to TCP/IP. So those Extenders can't be integrated in a TCP/IP Network.

Take good care of the cables: tight bends and squashes affect the High-Frequency properties of the cable in a negative way.

In general, unshielded cable are preferred (U/UTP), as shields and screens may lead to higher signal damping and "echoes". This will reduce the maximum of the reachable extension distance.

It is good practice, and highly recommended, to install CAT 5/6 cabling (as well as all Audio and Video cables) at least 60cm or more away from ANY electrical power or control cables, as CAT cable screening reduces only some electrostatic noise and RFI. Magnetically induced interferences are not reduced!

If you want to install shielded or screened cables, use S/UTP, F/UTP or FTP cables. Make sure to properly connect the shield to the RJ-45 housing.

As all "ELR" based Extenders use a special Modulation on the CAT x cables, S/UTP, F/UTP or FTP can be used without problems.

If you install 2 or more Extender cables in parallel, you need to use shielded cables to control Cross-Talk effects between the links!