



The BAL101 is a passive video balun allowing transfer of a quality real-time monochrome or colour video signal over Unshielded Twisted Pair (UTP) CAT5. These units are used in pairs, one acting as a transmitter the other as a receiver. These baluns allow transmission distances of up to 300 metres down a CAT5 cable. The BAL101 used as the transmitter has a BNC connector for attaching a camera and the CAT5 twisted pair is connected to the terminal connection.

The BAL101 receiver has a BNC connector for video out and the terminal connection for the CAT5 cable. Passive units do not require power.

Background Information

Co-axial cables are classed as an “unbalanced” mode of transmission and CAT5 twisted pair is known as a balanced mode. In this balanced mode, the two cores carrying the video signal are balanced to a particular reference point and the cable twists enable a uniform rejection of interference, effectively cancelling it out. To produce an unbalanced signal **BALUNs** are used, standing for **BAL**anced to **UN**balanced.

Baluns come in two distinct groups. *Passive* baluns require no power to operate and work up to distances of about 500M although if you are using baluns to send video signals back to multiplexers, quads and DVRs it is recommended not to use passive baluns over 200mtrs. *Active* baluns require power for their “active” circuitry and can send video signals over 1Km down low-cost CAT5 cable. Most baluns do not allow you to send power down the CAT5 cable so you will still need to power the camera locally or run another separate cable for power.

What’s in a balun?

Baluns contain small signal transformers that are specially tuned to match the cables impedance and convert the unbalanced signal to a balanced one and vice versa. Passive baluns just have the transformers and very little else in them. Active baluns have extra electronic circuits used to amplify the signals helping prevent losses and also filtering out unwanted noise.

The Advantage of using CAT 5 cable.

CAT5 cable allows a tremendously flexible way to install and distribute CCTV signals around buildings and between locations. If for example you have two buildings 100 metres apart you could use one CAT5 cable to run four CCTV images from one building to another using a passive BAL101 for the transmitter and receiver for each channel. Often you can find a spare CAT5 cable that is not being used but was put in originally as a spare data cable. CAT5 cable is also easy to handle and quite low cost. New commercial buildings are often “flooded” with CAT5 cabling, allowing tremendous scope to alter where and how CCTV cameras are used without necessarily having to install new and additional cables. Computer installation engineers use what are called “patch panels” and can also be used with great success for

CCTV installations. In this structured cabling system you have to work out where CCTV equipment may be needed and install the appropriate CAT5 outlets nearby. It is also wise to provide some local source (or potential source) of power. By bringing all the CAT5s to one area and installing what is called a “patch panel” you can then re-distribute the signals however you please.

Using the BAL101 passive video balun transmitter and receiver.

The balun requires a pair of cores in the CAT5 cable to send each video signal down, and there will be a balun at each end of the CAT5 cable. One balun converts the unbalanced signal to balanced for communication across the CAT5 balanced twisted pair and the second balun converts the balanced signal to an unbalanced signal. Therefore two baluns are always required. The transmission distance is up to 300 metres but please refer to previous details.

Step 1– Run in your CAT5 cable. This needs to be run between your camera and the rest of your CCTV equipment. One CAT5 cable with 4 pairs can theoretically carry 4 video signals, one per each pair of cores. It is good practice to run in more CAT5 cable than you actually need as this gives tremendous flexibility to add extra cameras, audio feeds etc.

Step 2– Identify the various matched pairs within the CAT5 cable. Four pair CAT5 cable has 4 easy to identify pairs.

Step 3 – Connect the SAME matched pair of cores to both the passive video baluns using the terminal connections. Always adopt the same standard using the SOLID colour core as “-” and the striped core as “+” when connecting to the balun terminals. It does not matter which pair of cores you choose to use but they must be *a matched pair* and you must get the polarity of the cores correct at the baluns.

Step 4 – Use BNC–BNC leads to connect from the BAL101 receiver to the DVR.

Technical Specifications

Video Input or Output	1
Video Input or Output Connection	BNC
CAT5 connection	Terminal Strip
Power	N/A Passive
Maximum Transmission Distance	Up to 300 metres *

* **IMPORTANT** –You may get a good picture when connecting directly into a monitor but a poor or bright picture when connecting into a DVR or a quad. This is because monitors are very “forgiving” with the level and quality of the video signal supplied to it. Quads, Multiplexers and DVRs are far less forgiving and require a near perfect video signal to give good results.

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