



CATV Hub (500300/301/303/304)

Frequently Asked Questions (FAQ)

1. **Do unused ports require terminators?** No. Unused ports do not require terminators.
2. **Do you sell RJ45 attenuators (variable or fixed) in cases where shorter UTP cables need to be padded?** No. MuxLab does not sell RJ45 attenuators.
3. **Can that padding happen at the hub, or must it happen at the subscriber drop after the station side balun?** Padding could be added at the hub or subscriber side. If RF attenuators are used they must be RF coax.
4. **Do you have any actual system design drawings showing what has been done at customer sites?** There are some success stories and application guides/notes at the following links;
http://www.muxlab.com/assets/files/success_stories/VE_Success_Story_9.pdf
http://www.muxlab.com/assets/files/success_stories/VE_Success_Story_3.pdf
http://www.muxlab.com/assets/files/application_guides/VE_CATV_Balun_II_AG.pdf
http://www.muxlab.com/assets/files/application_notes/CATV_Distance_Calculator.exe
5. **Can all 16 ports be connected up to any cable of any length, via Cat5e patch cord, and be expected to function?** The performance of each port on the hub will depend on the highest channel frequency being received, cable length and receiver sensitivity. Therefore, the application must be designed for the worst case scenario which is the longest cable length and highest channel frequency. At 330 ft it becomes more challenging to reach these distances. Typically 150 to 200 ft is a more realistic cable length for 900 mhz even with additional amplification.
6. **The 16 port hub provides a maximum gain of 13.1 dB (for the 8 port it's 15.9 dB). What is the range of signal level? What does overdriven mean (input signal level too high, too many channels in system, unterminated output ports, et al)?** Overdriven means that the amplifier is in saturation mode, in other words, the input power has exceeded its maximum allowable level for the amplifier. There are two cases where this can happen: one is where the signal into the hub is too high and the other is where the signal into the TV is too high. That is where the color starts to look saturated (too rich). The level that reached the the TV will received between 0 to 15dBmV for analog channels and -12 to 15dBmV for digital channels. One usually works backwards from the allowable TV levels to determine the input power required. The maximum input power into the hub allowed is approximately +45 dBmV. If the color starts to look saturated, the amplifier inside the hub or TV is being overdriven. If the cable lengths between the CATV Hub and each TV are very different, it is possible to overdrive the television receiver at shorter distances (colors on the TV appear saturated) and have a noisy image at longer distances. This is where tilt amplifiers are useful. For example the table at the following link should be used to calculate the attenuation at the lowest and highest channel for each output to determine out how much power will reach the television and to check if it is within the receiver specifications.
http://www.muxlab.com/assets/files/application_notes/CATV_UTP_Attenuation_Table.xls
7. **What is the maximum output level?** The maximum output level from the hub is approximately + 58 dBmV.
8. **If I need to have additional amplification in front of the hub, do I launch from that amp (ie- a Blonder Tongue 30dB 850Mhz RMDA) at a standard 36dBmv (ch 2) 44dBmV (Top Channel)?** Yes. Any bi-directional CATV amplifier is good.
9. **The term “buffered” appears in the datasheet. What does this mean?** It means the same as port-to-port isolation.

10. **What is the port to port isolation on the hub? What is the level (in dB) of port isolation in the 8 and 16 port hubs?** The actual isolation between output ports is around 45dB. A good port to port isolation means that if a signal were to come in on one of the output ports, it would not come out at the other output ports, i.e. they are isolated well.
11. **If the hub is not plugged into a power source will it work as a passive device?** No. If the hub is not powered up, it will not pass a signal.
12. **The hub is specified as a 900MHz component. How well does it perform at channel 134?** It performs very well. At longer runs, an additional amplifier is required in front to accommodate for the attenuation from the UTP.
13. **What is the channel loading, meaning, how many channels can be in the system before the power draw becomes too great and the amplifier overheats? Also what is the noise factor of the amplifier?** The hub amplifies all channels in the frequency range of 55MHz to 900MHz without overheating. The more amplifiers in cascade, the greater the noise/distortion factor.
14. **The load is 75 Ohm and the noise factor is 2.4dB. Is this a number I can use when calculating C/N for cascaded amplifiers (BT amps are typically 7-8dB for 30dB gain)?** It's generally not used in a calculating manner as many things would need to be taken into account as well. It is usually used when choosing devices. It gives you an idea as to which amplifier adds more noise. If you have a system that is sensitive to noise, it is suggested to choose the amplifier with the lower noise factor. An example of such a system would be one in which the signal power coming in is already very close to the noise floor. Please note that noise from the first device is amplified in the next device. Consequently, when cascading amplifiers, it is better to use the lower noise factor one closer to the head end.
15. **What type of amplification is used (push-pull, power-doubling, etc)?** It is a voltage-controlled low noise amplifier.
16. **Is there a formula or spreadsheet you use for calculating system losses and required input signal levels at certain channel frequencies when using Cat5 cable? Is there a formula for using Cat5e versus Cat6 cable?** Yes. Please find below a link to a signal loss chart for Cat5e/6/7 cable at different channel frequencies and cable lengths: http://www.muxlab.com/assets/files/application_notes/CATV_UTP_Attenuation_Table.xls
17. **What is the limiting factor that determines the maximum distance of this technology. Is it emissions from the 500304 hub or emissions from the cat 6 cable itself?** The limiting factor that determines maximum distance depends on whether the installation complies with emissions standards or not: A) If the installation complies with emissions standards, then the limiting factor is the emissions standard which dictates that maximum acceptable input power. Therefore, if shielded Cat5 cable is used, emissions are lower and an extra 10dB gain is acceptable thereby yielding greater distance. B) If the installation does not comply with emissions standards, then the limiting factor is the maximum input power that can be applied before the TV receiver is overdriven. Emissions testing takes into account the hub together with the Cat5e cabling. Selecting higher grade twisted pair (Cat6/7) allows greater distance to be achieved for a given input power.
18. **What is the maximum allowable RF input signal power in order to pass FCC Class A?** The maximum RF input power levels in order to pass FCC Class A are as follows:
 - CATV Balun II (500302) in pairs: 25dBmV
 - CATV 8 Port Hub (500301): 16 dBmV
 - CATV 16 Port Hub (500304): 13 dBmV

19. **What is the maximum allowable RF input signal power to the hub?** It depends on the number of analog channels (A) in the cable and it depends also on the number of digital channels (D); although digital channels are less of a problem because it is much lower in power. The formula is as follows:

$$\text{Max signal power to the hub} = 45\text{dBmV} - 20 \times \text{Log}(A+D/5)$$

For example, if we have 20 analog channels and no digital channels, the max power to the hub will be 19dBmV (45-26). The hub introduces an amplification of approx. 15dB, and the TV should have a signal strength of at least 0dBmV for analog signal and -12dBmV for digital channels. The maximum cable distance also depends on the grade of the cable (Cat5 to Cat7) and the frequency. In each case the attenuation can be determined by the attenuation table in the Support section of the MuxLab website.

For more information, please contact MuxLab Customer Technical Support at 877-689-5228 (North America) or (+1) 514-905-0588 or at videoease@muxlab.com or visit <http://www.muxlab.com/>.

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