

Οδηγός Καλωδίωσης
για Ευρυζωνικές Υπηρεσίες

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**Wiring Guide
for Broadband Services**

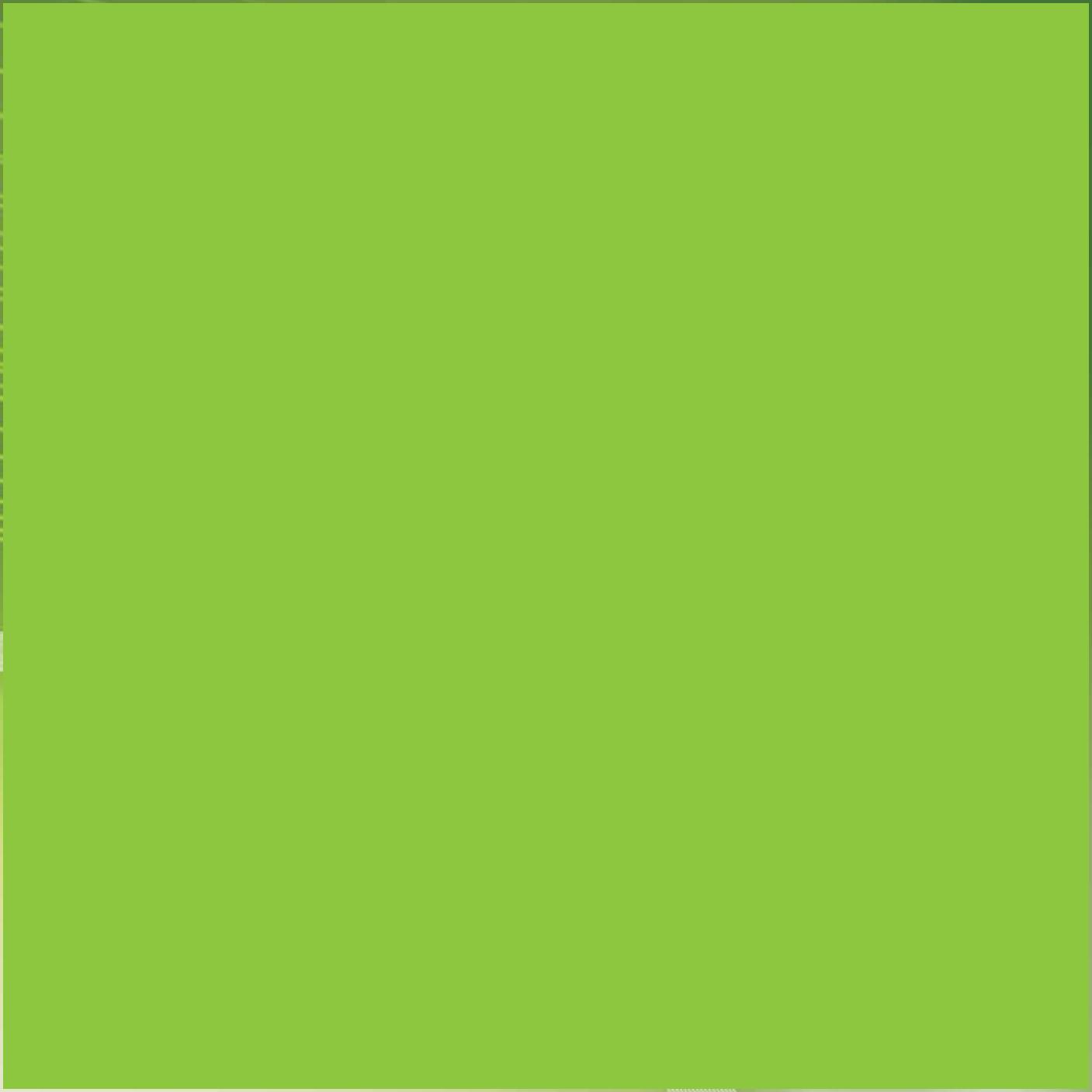
Νιώσε κοντά,
φτάσε μακριά





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1.

Introduction

This cabling guide is addressed to home owners, owners of other premises and other interested parties who are planning, installing or intending to replace the internal telephony wiring in existing premises.

The quality of broadband services depends to a great extent on the internal wiring (cabling) of the premises in which they are installed. This guide refers to all the factors that can affect and possibly degrade broadband services. It also provides some simple, good practices that will ensure the quality of the broadband service.

The need for proper wiring (cabling), connectivity and implementation of good practices concerns all DSL technologies but it is even more essential with the introduction of VDSL technology for the provision of high speeds.

2.

Parallel connected telephone sockets and their effect on VDSL2

Using parallel connected telephone sockets is one of the methods used when installing telephone sockets within a building. The above methodology includes the creation of parallel connections, also known as “bridge” connections for the telephone signal (e.g. a T junction) to distribute the telephone signal from one room to another or from one floor to another

floor within a building. In the presence of such parallel connections or “bridges”, the two separate connections cause unwanted reflections of the VDSL2 signal. **Figure 1** shows three of the most common locations where parallel connections within a building may be found.

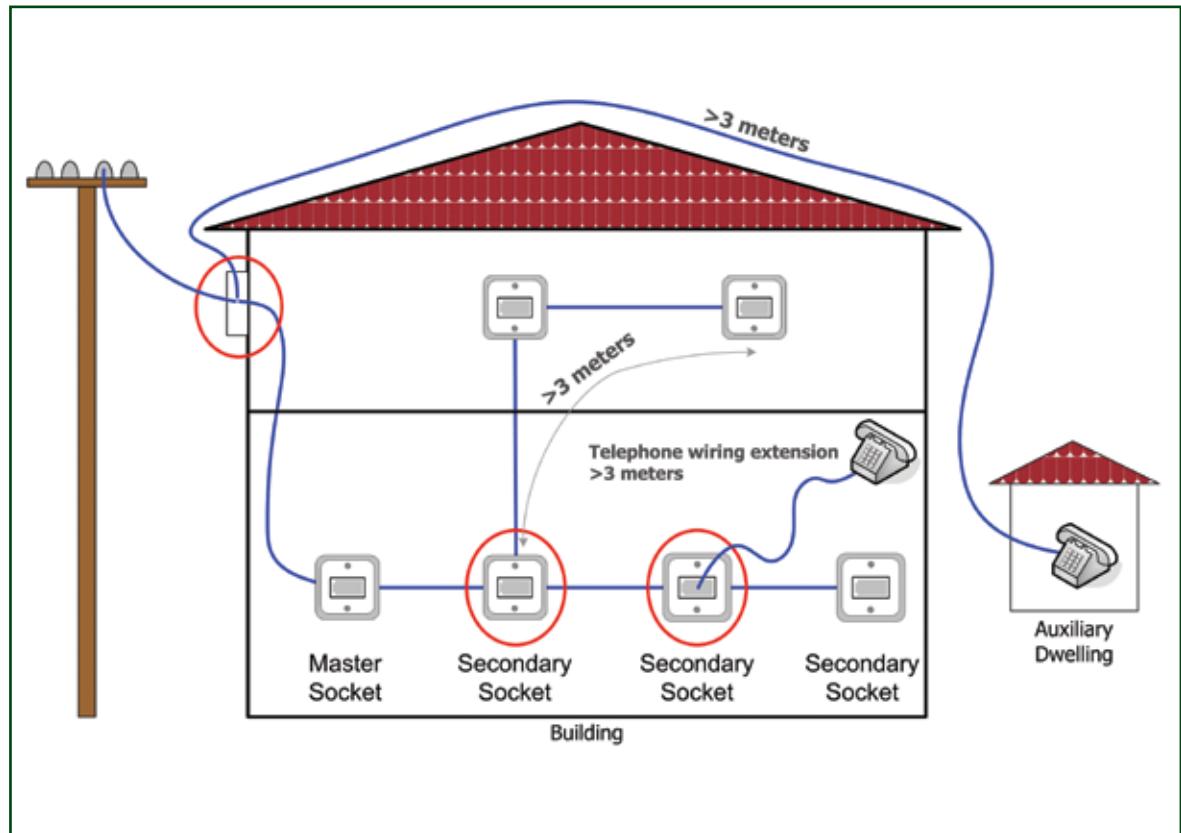


Figure 1
Likely locations of parallel connections in a building telephone installations.

VDSL2 technology is negatively affected by parallel interconnections. The VDSL2 signals are reflected by the parallel cable branches, sending part of the signal strength in the opposite direction within the telephone cable, just like a ball bouncing on the

ground (**see Fig. 2**). The echoed signal is now out of phase and mixed with the original and creating, among other impairments, attenuation and distortion. The modem receives both signals, gets confused and “takes errors” or cannot synchronize.

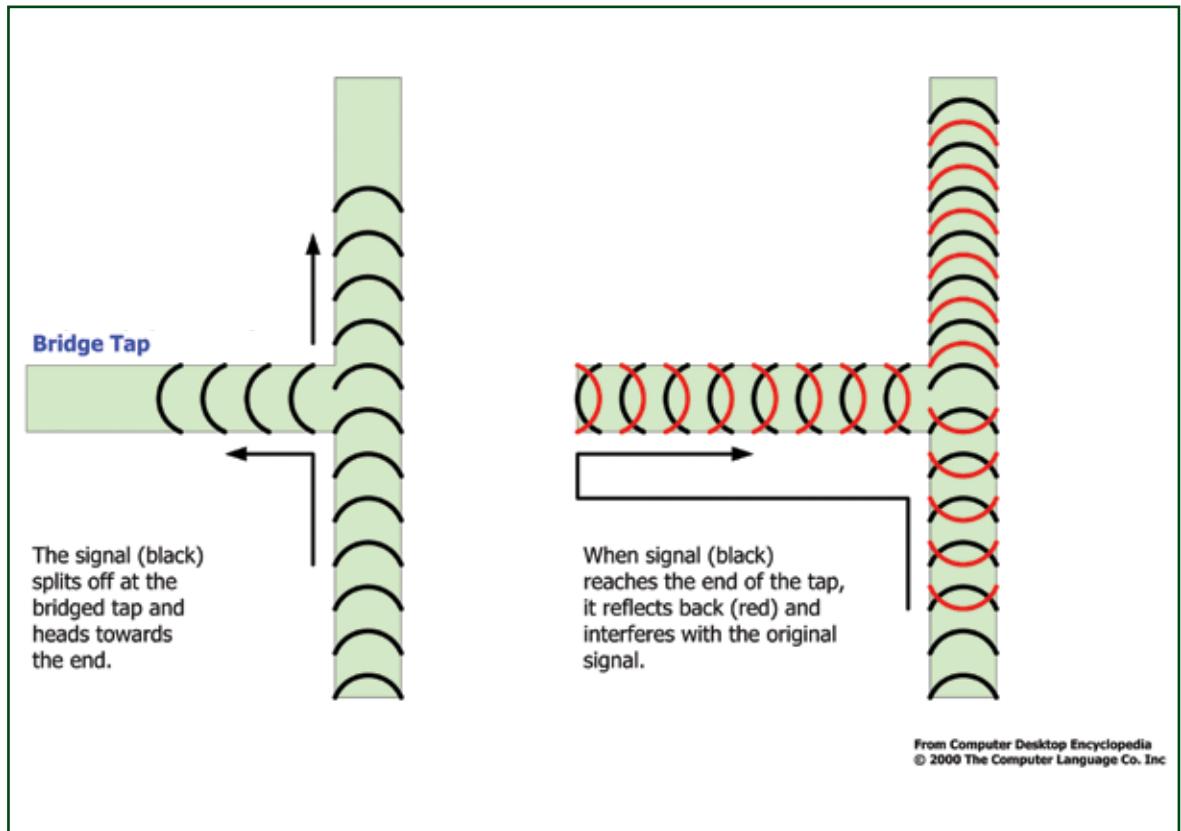


Figure 2
Effect of parallel connections on the VDSL2 signal.

3.

Wiring and interconnecting the VDSL2 modem

In this section you will find examples of wiring and interconnecting a VDSL2 modem, so as to overcome problems caused by parallel connections.

3.1.

Simple connection

Figure 3 shows the simple connection in which the VDSL2 modem is connected to a single home telephone socket. In this case a VDSL2 centralized splitter is inserted into the socket. The splitter separates the telephone signal from the broadband signal. The centralized splitter is provided by Cyta with the VDSL2 modem. The outputs of the centralized splitter are connected to the VDSL2 modem and the telephone handset respectively.

It should also be noted that VDSL2 technology does not allow the use of filters used with ADSL/2+ technology (which you may possess if you were a subscriber to one of our ADSL/2+ services), while the use of a centralized splitter is essential.

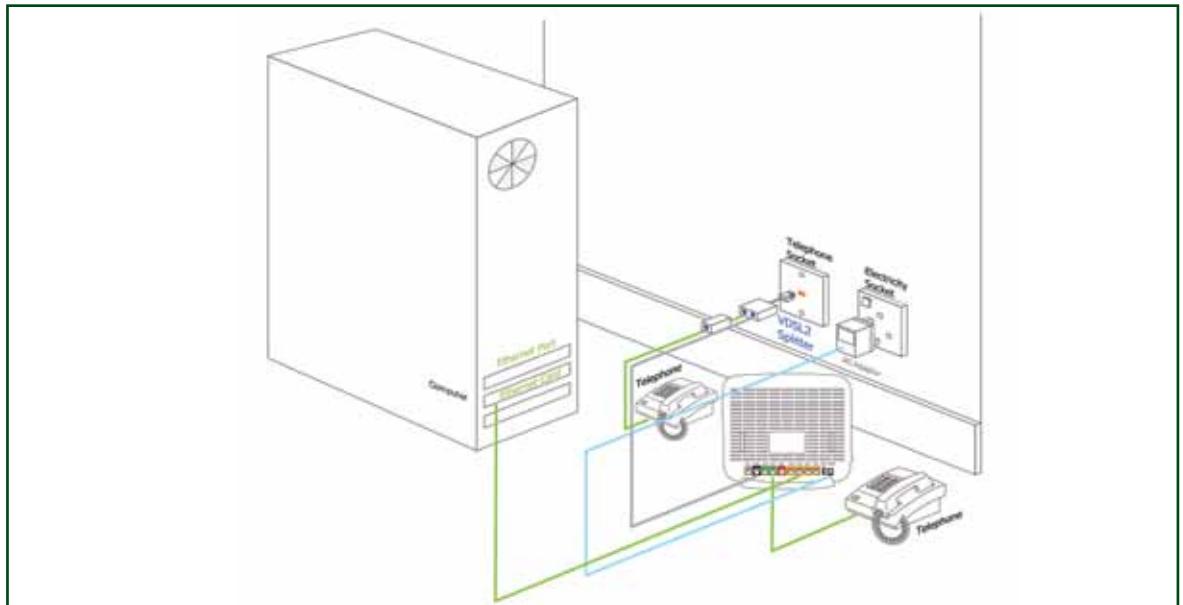


Figure 3
Simple interconnection of a VDSL2 modem.

3.2. Installations in existing premises without structured cabling or star type cabling (star topology).

As noted above, it is essential that the VDSL2 modem be connected to the 'unique' telephone socket of the premises. If a building has more than one telephone socket, the VDSL2 modem must be connected to the primary* socket. Moreover, the interconnection of the primary telephone socket to the other sockets must be done in such a way as not to interfere with the VDSL2 signal (**Fig.4**).

As shown in **Fig. 4**, the primary telephone socket to which the VDSL2 modem is connected is replaced by a double telephone socket and the telephone service is provided after the centralised splitter at the double telephone socket in order to link to the rest of the telephone sockets in the building. We recommend the use of 'Secondary' telephone sockets since it has been

observed in practice that 'Master' telephone sockets can cause interference to the VDSL2 signal. If the telephone socket to which the VDSL2 modem is connected is not the 'Primary' socket in the home, it must be converted to the 'Primary' socket (**see note 3.3 below**). It is stressed that VDSL2 technology does not work if this rule is not adhered to. If the above procedure is not followed, problems are bound to be caused to the performance and reliability of the service.

* The term «Primary» telephone socket refers to the first socket to which the telephone cable originating from the building distribution point terminates, making sure that this cable does not connect to any other telephone sockets inside or outside the premises.

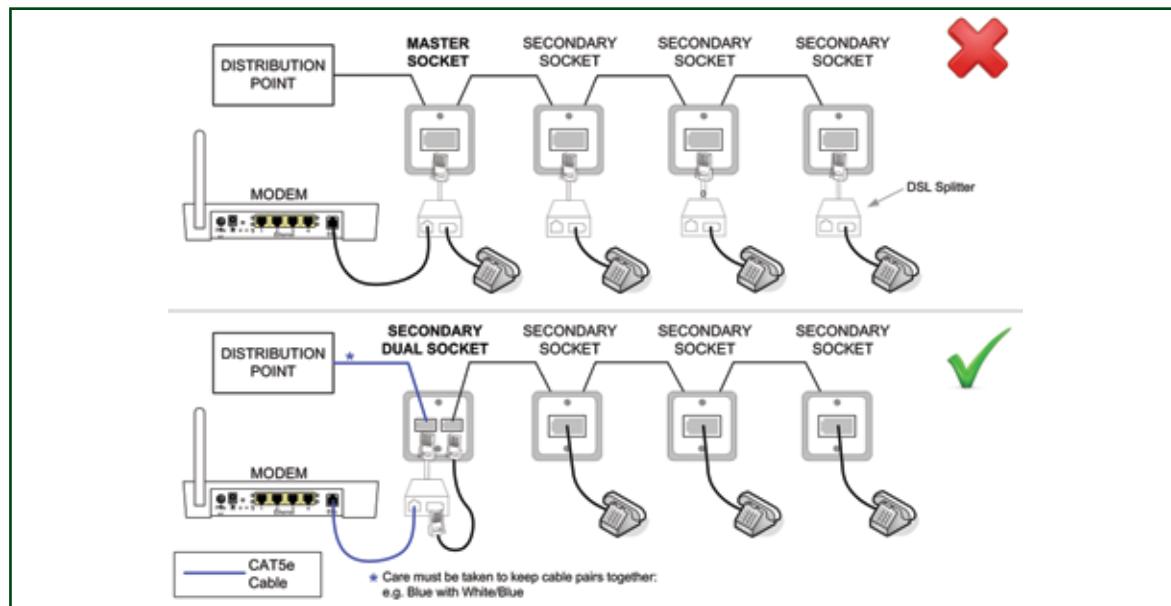


Figure 4
False and appropriate ways of interconnecting the VDSL2 modem to the primary telephone socket.

3.3. Installations in existing buildings without structured cabling or star topology wiring and where it is necessary for the modem to be connected to a telephone socket other than the 'primary'.

In existing homes where it is necessary for the modem to be connected to a telephone socket other than the 'primary', it is essential that the telephone socket to which the VDSL2 modem will be connected, is converted into the 'primary' socket. Furthermore, any additional telephone sockets must be connected to the output of the centralised splitter. **Fig. 5** below shows the false and appropriate ways of interconnecting the VDSL2 modem and the correct way of interconnecting any additional telephone sockets.

The conversion of the socket to which the VDSL2 modem is connected into a 'primary' socket is done through the addition of a CAT5e cable from the distribution point to this socket, the installation of a double socket and providing the telephone service after the centralised splitter to the socket so as to provide the telephone sockets to the rest of the telephone sockets. We also recommend the use of 'secondary' telephone sockets since it has been observed in practice, that 'master' telephone sockets can cause interference to the VDSL2 signal.

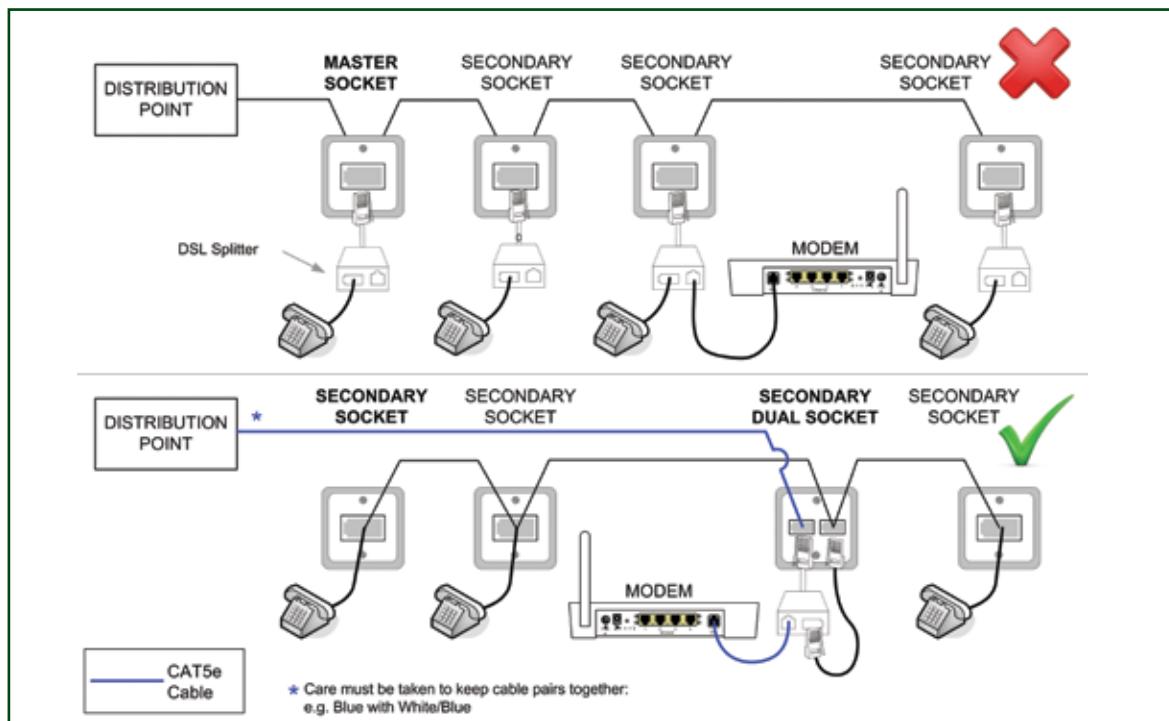


Figure 5
False and appropriate ways of interconnecting the VDSL2 modem to a telephone socket other than the 'primary' socket.

3.4. Installations in premises with structured cabling or star topology wiring.

In cases where the modem is installed in a central broadband and telephone distribution cabinet, as shown in **Fig. 6** below, it is easy to avoid parallel

telephone connections within the premises, hence avoiding problems with the performance and reliability of the broadband services.

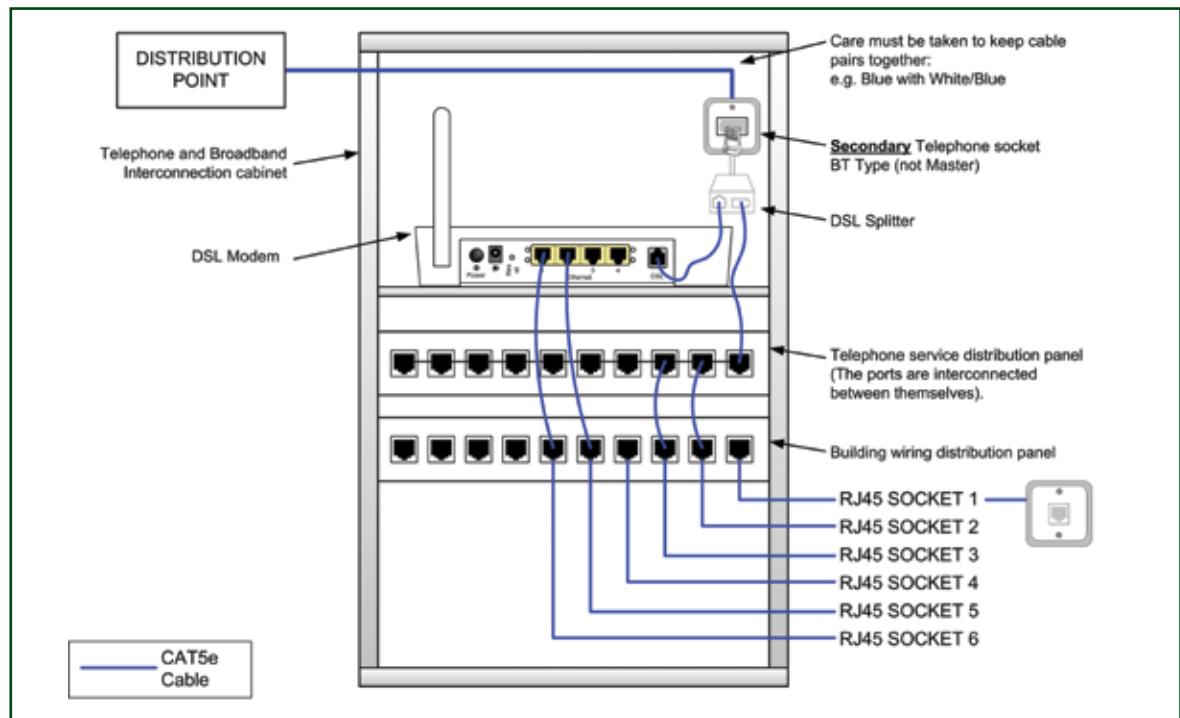


Figure 6
Central broadband and telephone distribution cabinet.

4.

Good practices for VDSL2 service installation

In this section you will find some simple good practices that will guarantee the performance and reliability of your broadband services.

- Routing the telephone cable via a conduit carrying electricity cables should be avoided. Apart from the danger of electrocution, electricity cables interfere with the VDSL2 signal within the telephone cable.
- Installing the telephone line or the VDSL2 modem close (less than 1.5m) to halogen lamps, fluorescent lights, energy-saving and LED lamps should be avoided. Also, the modem's power supply should not be plugged into a power socket shared with lamps of this type.
- Installing the telephone line or the VDSL2 modem close (less than 1.5m) to dimmable lights (e.g. a desk lamp with a dimmer switch) should be avoided. Also, the modem's power supply should not be plugged into a power socket shared with dimmable light systems.
- Placing the modem on top of a computer (especially towards the back) should be avoided. This is where the computer's power supply is located and it may interfere with the smooth functioning of the modem.



Figure 7

Placing the modem on top of personal computers or close to lamps with a dimmer switch should be avoided.



Figure 8
Routing the telephone cable next or around chargers or multi-plug adaptors, or next to devices with a motor should be avoided.

- Installing the telephone line or the VDSL2 modem close (less than 50cm) to other devices should be avoided. Examples of such devices include airconditioning units, refrigerators, hair dryers, washing machines, food and drink mixers, treadmills or any other device containing any kind of motor. Plugging the modem's power supply into a multi-plug adaptor into which any of the above devices is connected should also be avoided.
- Placing the VDSL2 modem on top of other devices or in a small enclosed space should be avoided, mainly to avoid problems of overheating.
- Installing the telephone line or the VDSL2 modem on top of or very close to (less than 30cm) other electronic devices should be avoided. Examples of such devices include DVD players, routers, stereo systems, set-top boxes, satellite dishes,



Figure 9
Placing the VDSL2 modem close to other electronic devices should be avoided.

loudspeakers, TV sets, HD screens, etc. You should definitely avoid installing the modem very close to another modem.

- The modem's telephone cable should not be wrapped around other power supplies or power cables (usually the case behind television sets or computers).
- The internal wiring of the premises should be in good condition, e.g. there are no corroded or loose connections, the copper pairs are well twisted they are protected from moisture and humidity.
- It is recommended that you use 'secondary' telephone sockets and wherever 'master' sockets are identified the capacitors should be removed (ring capacitor and spark gap surge arrestor) from such sockets (**Fig. 10**).

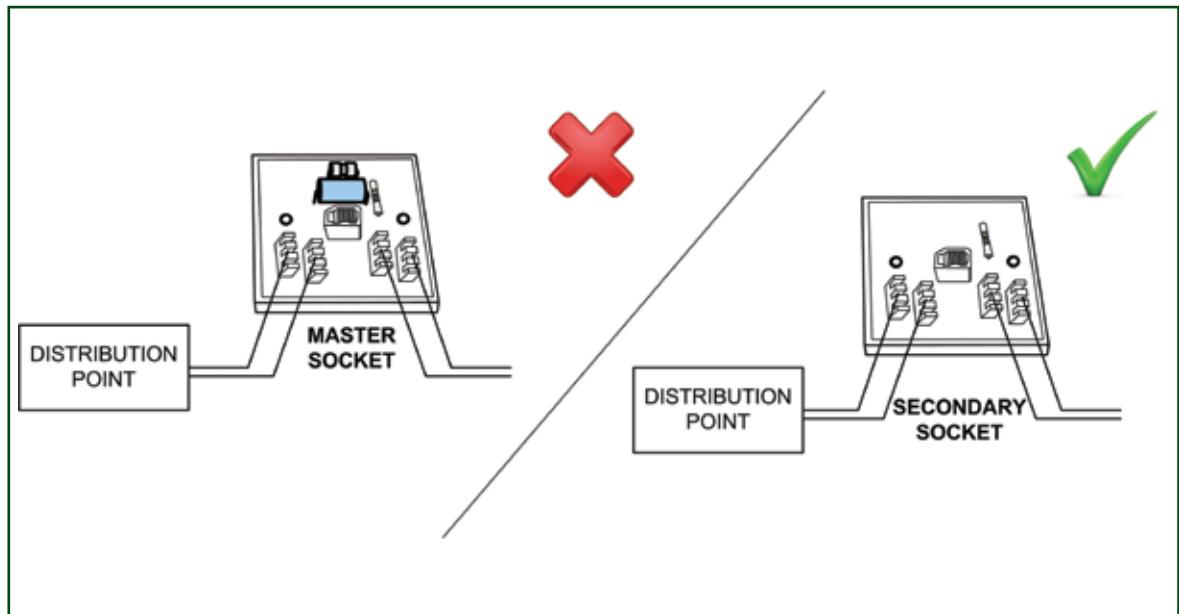


Figure 10
The use of 'master' telephone sockets should be avoided. Use only 'secondary' telephone sockets.

5.

Where is the distribution point located?

The distribution point (the point where the cables terminate outside the premises) from which the CAT5e cabling should start is defined as follows:

- For overhead telephone lines, it is the box on the outer wall of the building where the Cymru drop-cable terminates, and the buildings' internal wiring initiates (**Fig. 11**).

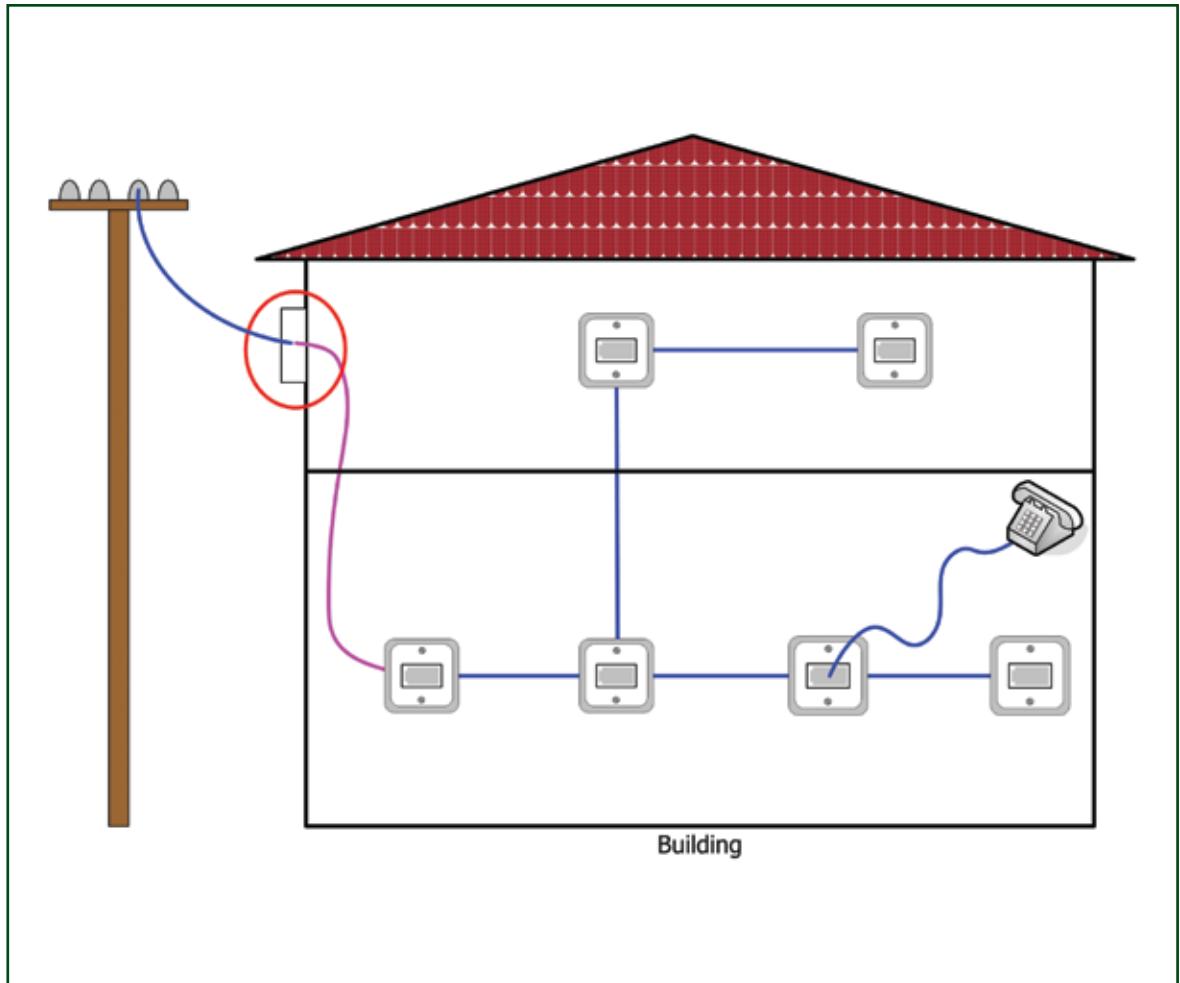


Figure 11
Location of the distribution point when service is provided via overhead lines.

- For detached and semi-detached homes connected to the Cyta network via underground access, it is the box which is usually located on the outside wall

of the building and it is where the Cyta underground cable terminates, and the buildings' internal wiring initiates (**Fig. 12**)

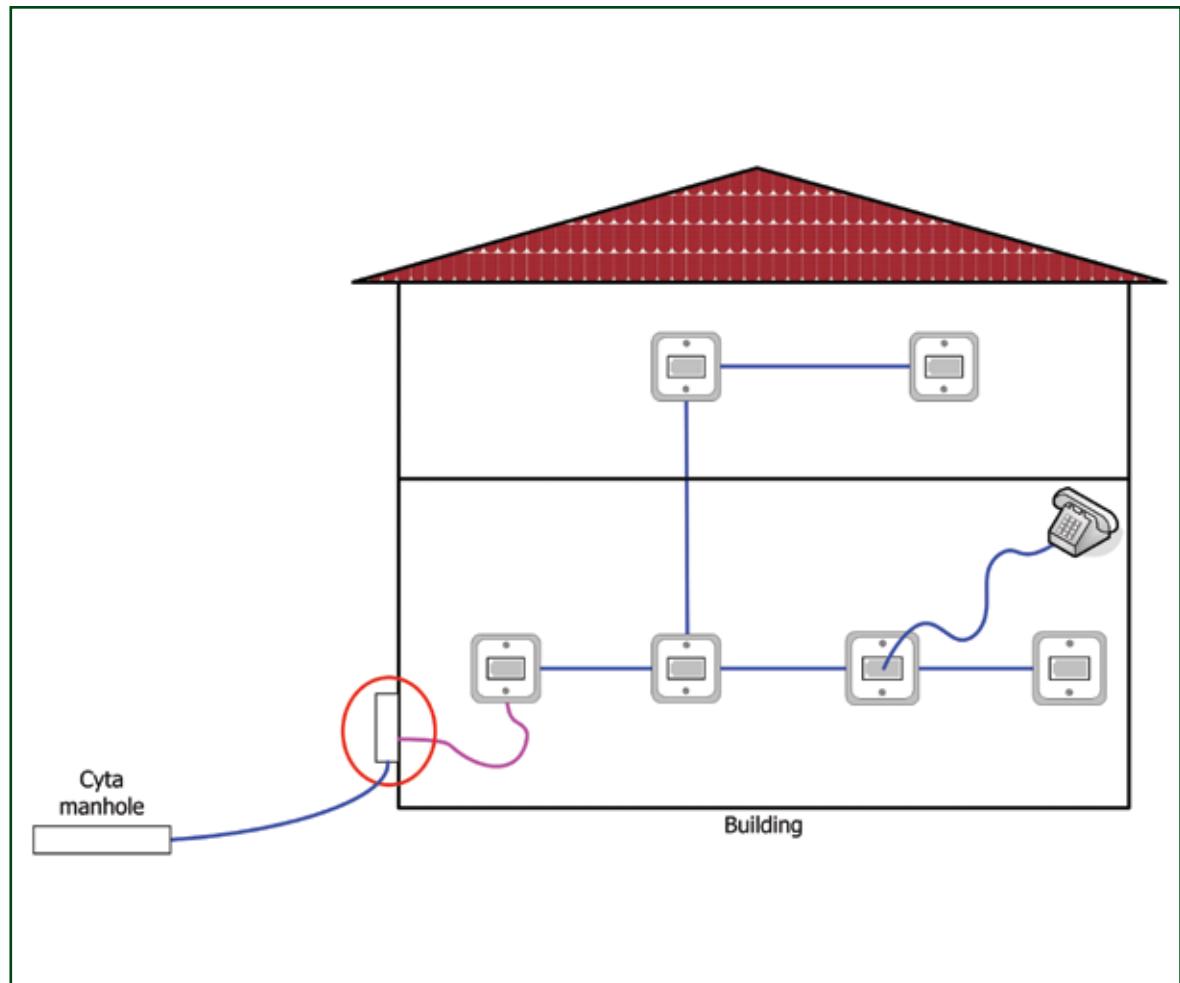


Figure 12
Location of the distribution point when service is provided via underground cables.

- In apartment blocks the distribution point is located at a central point in the building called the central distribution point. Moreover separate floor distribution points may exist which are located at central locations on each floor. Depending on the quality of the existing cabling which connects the central distribution point to the floor distribution points) (**Fig. 13**).

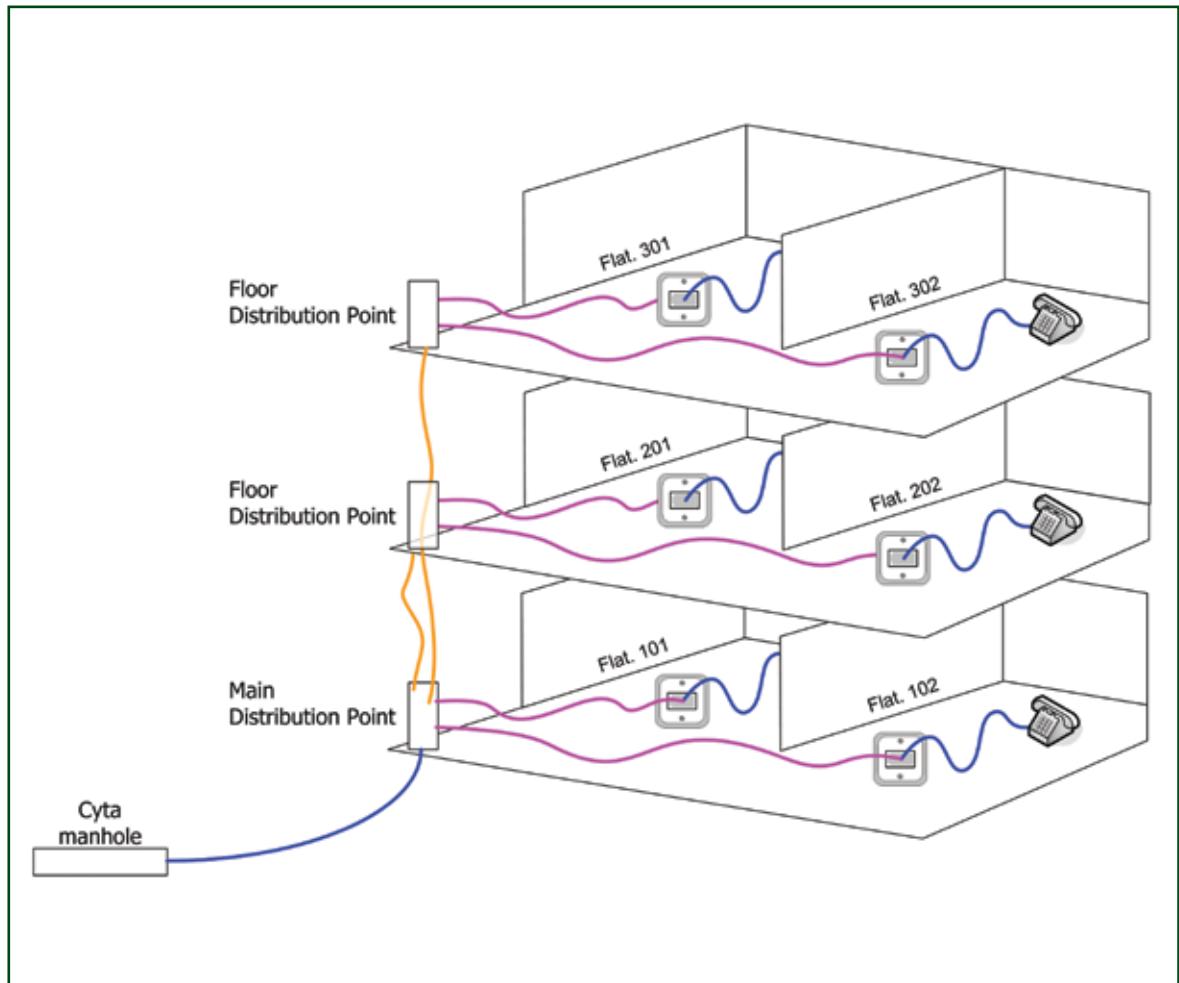


Figure 13
Location of the central distribution point and separate floor distribution points in apartment blocks.

