

## A quick guide to HomePlug

### What, why, who, how explained

by Rob Kerr published on 9 February 2009

#### What is it?

HomePlug or PowerLine, depending on which vendor you speak to, is a technology and series of products that turns your home electrical circuit into a local area network or LAN.

These devices plug into a normal power socket on the wall, whilst an Ethernet cable runs from the product to a computer, gaming console or similar device.

When connected to the likes of an ADSL or DSL router, this in turn delivers internet access to one of the devices listed above.

It's an alternative to wireless technologies, bettering them in most cases by providing a solid, constant, reliable signal and at speeds that can almost be four times that of normal wireless products.

#### What are the variations of the technology?

There are really only three variations to HomePlug or PowerLine technologies; these mainly boil down to the speeds delivered to the device.

The first is known as HomePlug 1.0, this was the very first incarnation of the technology and is still around today in the more budget orientated models. This version only reaches around 14Mbps maximum throughput. The speed obtained here is just below a third of the common standard of wireless technologies today in 802.11g or 54Mbps, which is seen inside most ADSL routers.

Next up is the HomePlug 1.0 Turbo, which reaches 85Mbps and surpasses most wireless networks around today. It also provides, just as before, a good solid, reliable constant signal over any distance.



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At the top of the range is HomePlug AV, which offers close to 200Mbps almost four times that of what common place wireless routers can provide. This is ideal for some tasks that rely on large amounts of data getting to devices, from the Internet or just inside the home. In this version security and encryption is also featured as a standard, ensuring high levels of privacy not always seen in others.

There are also various models and ways these are presented in products, we'll go into these in more detail later. All of them come along in the various standards listed above, with a cost to suit all pockets and from nearly all the known manufactures of wireless routers which complement their existing range.

Why should I care?

As an alternative to wireless technology, HomePlug or PowerLine can deliver a good solid signal over some distance as it operates over a fixed power circuit of a home and not over the airwaves.

This can be beneficial for the likes of data intensive operations such as video streaming. Where if the laptop, PC or gaming console is some distance from the wireless base station the signal can be very intermittent.

With the likes of high definition video streaming, the need for a solid, stable signal to one of those devices is very important. As the amount of information and data being streamed over the Internet is quite vast, where wireless technology is not always up to that type of challenge.

Not only that, but the further you are away from the base station a lesser signal will always be obtained. If you're paying for the likes of a 22Mbps connection or Virgin's latest 50Mbps shouldn't you be able to receive it everywhere in your home and at that very speed?

One of the negative aspects is that you need to

be near a power socket for this to all operate. Seeing as the technology is based around just that, the device being used is nearly always tied to that central location.

What's a good example in practice?

A lot of known companies around today have invested in producing HomePlug or PowerLine devices, most are in a variety of different models to suit all tastes. These are from established companies such as Netgear, Linksys, Belkin and Zyxel amongst others.

The majority of devices arrive in several formats, these fall into a few camps of network speeds, the amount of connections on offer and physical formats.

More commonly seen today are products that look much like a power extension block that plugs into the mains socket, offering up power to multiple appliances. Although they look almost identical, these only provide HomePlug abilities by offering up an Ethernet connection for your PC, games consoles or other such devices.

These can be seen providing up those speeds mentioned of 14Mbps, 85Mbps and 200Mbps. With two really needed to see the benefits, most starter kits are sold in pairs, one being used for the device that needs the data and another that's plugged into the device that offers up the data.

Normally these provide access to just one Ethernet port, but there are products around with multiple ports which can also operate as a switch. This is where each and every port is given the same priority and bandwidth. It's as if there are four of these single devices, all plugged into the wall at once only in one unit.

The other physical format that's seen around looks much like a standalone networking hub, which has the appearance of either a single Ethernet port or a collection of them often seen at the back of a wireless ADSL router.

In this format, the data is taken and transmitted

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up the power cable to a normal looking plug. Which has benefits all in itself, as this form could be used and expanded upon for other products in the future with the likes of wireless routers with this technology built in.

Other more uncommon, but equally useful HomePlug or PowerLine products are known as wireless extenders. These are sold in a pair too, both looking like a normal device with one of them having an Ethernet port and the other one not. The "dumb" version takes a signal from a wireless router and then transmits it over power circuits of the home, to increase the wireless reach beyond normal range.

There are also products starting to emerge with HomePlug or PowerLine technologies built inside. Logitech has a range of surveillance video equipment which operates over the power line, providing access to these cameras anywhere in the world.

Is there a competing technology that I should be aware of?

An alternative for fast connectivity around the home is always wireless access, of any sorts, where this is lacking is in its current speeds.

A lot of shipping HomePlug or PowerLine products around today run at 200Mbps, where as the most commonly seen wireless standards used is as we've mentioned 802.11g at 54Mbps. The next emerging standard of the 802.11 wireless standards is the incarnation "n", which could reach 300Mbps.

802.11n is around today, but has yet to be fully adopted by customers and vendors as the standard as it's yet to be fully signed off on. Although in its current format, it's almost ready to go as a proven technology.

The signal strength from wireless technologies fluctuates and varies, from moment to moment and is disrupted by walls and ceilings. Where the

signal obtained by the HomePlug devices is said to be steady and non-intermittent. It's setup as if the device is plugged straight into the other one it's getting or transmitting data to, much like a traditional LAN or local area network seen in most offices today.

On top of the varying signal strength letting down wireless connections, there is also the range. In comparison, HomePlug technologies in theory should be limitless around the home, as it operates over the power circuit.

What is in store for the future?

The next products we'll be seeing on the HomePlug front are devices with the technology being built into them, as standard.

It's been rumoured for sometime that the likes of Linksys are soon to be including HomePlug in their range of products. These are likely to be in their ADSL and DSL routers, wireless or otherwise. This is where the power plug for the device already has HomePlug capabilities onboard.

This negates the need for having a separate device near the xDSL router, by offering up HomePlug around the home by default. This could also go some way to increase the range of the router beyond the reach of a wireless router, if one was used.

Other devices that could benefit from HomePlug abilities are games consoles that do not currently ship with internet connectivity, but have an Ethernet port at the rear. A device like this could benefit from having a combined HomePlug/dual Ethernet cable offering, straight from the box.

The Home Plug Alliance, which is the governing body of these standards is close to ratifying HomePlug AV2. This is set to be capable of 600Mbps and is aiming for being able to deliver HDMI content, over the home power circuit.