

Powerline

What it is and what it can do

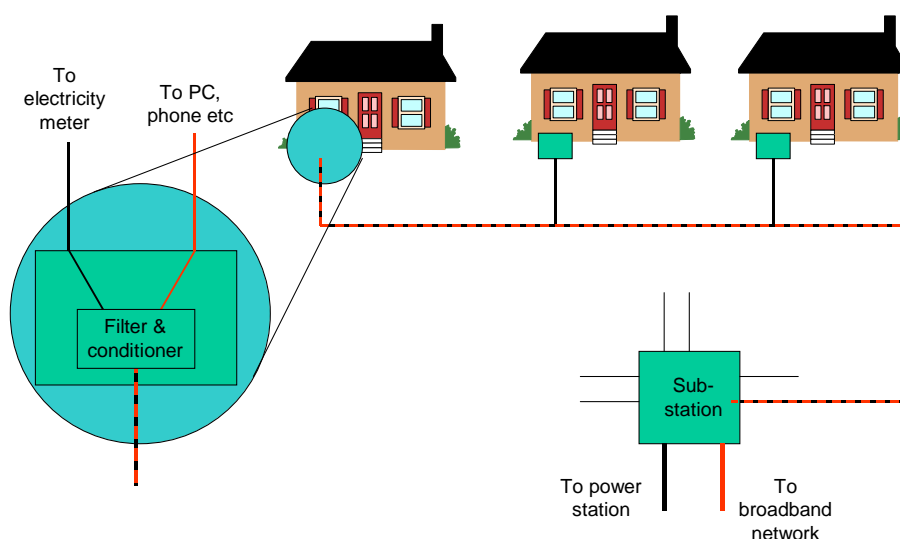
The electricity supply network is even more ubiquitous in Europe than the telephone network. This network of cables reaching nearly every building has seemed like an attractive carrier for communications services for some time. However, there are considerable technical, regulatory and commercial obstacles to overcome.

Powerline technology uses the electricity supply network to provide two-way broadband and phone connections by using filters that can separate the power supply flowing along the cable from communications signals. Power supplies normally run at a frequency of 50Hz, whereas communications signals are carried at much higher frequencies than this.

Each substation is connected to a broadband communications network, either by a dedicated network belonging to the electricity company or by direct connection to the public telecommunications network. Within the substation, the broadband signal is fed into the power supply cable and overlaid on the electricity supply. At each site (e.g. house or office block) that is connected to the Powerline system, a filtering and conditioning unit splits off the power supply from the communications network.

Key Messages for SMEs

- Powerline uses the electricity network to provide broadband communications
- It has the potential to provide services where no other option is possible.
- There are still considerable technical and regulatory obstacles to be overcome before it can be widely available



One major advantage of Powerline access over other methods is that the power network extends to most rooms in buildings and it provides the potential for broadband communication within the building as well as to a Local Exchange. The power supply network is also much more widespread than the telephone network in some of the less developed parts of Europe and this potentially makes it possible to supply broadband communications to a greater number of sites.

The main technical issues that have to be solved involve the frequencies to be used for data transmission. The frequencies needed to allow broadband working are in the same part of the spectrum as the frequencies allocated to some vital emergency services. Power lines are inherently very bad for leaking electromagnetic radiation and the use of these frequencies for broadband transmission could cause serious disturbance to radio services. There are also technical problems to be overcome with the fact that power lines are an inherently very noisy electrical environment. Germany and the UK are the only two European countries that have so far passed regulations for Powerline technology and the German rules allow significantly higher levels of emission and interference than those permitted in the UK.

This may be why the UK electricity company NorWeb, which conducted a major trial of power line technology during the 1990s, abandoned it in 1999, saying that it could not see a business case for a

commercial service. In 2001 the technology appeared to be staging a comeback, when a number of German, Austrian and Swiss power companies staged trials using equipment developed by the Swiss company Ascom. They included RWE in the Rheinland, MVV in Mannheim, Energie Baden-Württemberg in Düsseldorf (EBW), Tirolisches Wasserkraft (TIWAG) in the Austrian Tyrol, Freiburgischen Elektrizitätswerke (FEW) in Freiburg and Services Industriel de Genève (SIG) in Geneva. Elsewhere in Europe, France Telecom, Finland's Sonera and Spain's Endesa also announced trials of powerline technology.

RWE went on to launch a commercial service in July 2001. This was aimed at residential customers in Mülheim and Essen but, following a dispute with the equipment suppliers, the service was withdrawn in the autumn of 2002. More recent commercial offerings from German Swiss and Austrian power companies appear to have been more successful. However they seem to have been on a smaller scale than the RWE trial and several have been focussed on distributing broadband services within hotels or educational establishments.

Whilst current commercial products can offer data rates of up to 2Mbit/s in the local loop, speeds of 6 to 8Mbit/s should be possible in the near future. Some people believe that Powerline will be particularly suited to countries in central and eastern Europe as a way to launch broadband relatively cheaply, given their low fixed telephone line penetration rates.

Advantages and Disadvantages

Powerline takes advantage of the widespread electricity distribution network. Since this exists even in the most rural areas of Europe, this technology is one possible route for providing broadband communication in remote rural areas.

Powerline technology can also form the basis for a network within a site.

Powerline systems operate in much the same way as a cable modem because the capacity is shared by all of the users connected to the electricity substation. Each substation typically serves about 150 homes, so, if everybody signed up for service and used it simultaneously, it would be slower than using a PSTN modem. However statistics on Internet penetration and usage suggest that powerline technology will offer Internet access at speeds 15 to 30 times faster than ISDN almost all of the time.

There are still major technical issues to be overcome before the regulatory authorities across Europe can be convinced that this technology will not cause serious interference with users of radio equipment.

What to buy

At present there are only a few places where local electricity companies are offering commercial services but, where a service is available, it is an alternative to cable modems or ADSL. In general, the service provides a symmetrical, always-on, broadband connection at bitrates from 384kbit/s upwards. The monthly fee ranges from about €35 to €65. There is also sign-up fee, covering the cost of the modem and its installation, of between €100 and €250.

Very few of the companies who have experimented with using powerline technology to deliver broadband Internet access have gone on to launch successful commercial services. Unless it is the only option, small businesses should look for broadband access solutions based on more established technology.

Questions to ask suppliers

- Is the service available in my area and, if not, when will it be available?
- What data rates do you offer and is there a guaranteed minimum bitrate?
- What is the installation cost and the monthly charge?
- How big is the equipment and how much power does it need?
- What changes will need to be made to my computer(s) in order to connect to the modem?
- Will the service be as reliable as my existing telephone service?
- Who will own and be responsible for maintaining the modem?

- Is maintenance included in the monthly charge or is it an extra?
- How quickly will you respond to reports of faults?