



4G mobile broadband self-help guide



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Introduction

Everybody should be able to enjoy the benefits of online services and entertainment, however, it's not always possible where conventional home broadband is slow or non-existent.

A solution to this could be 4G Mobile Broadband, using the same connectivity as your mobile phone would use to connect to the internet outdoors. Even if you receive poor 4G signal on your mobile within your property, it doesn't mean this solution could not still work for you. We've produced this self-help guide to show the steps to find out if this solution could work for you, and what options are available to receive one. We've also included a case study from a rural West Sussex business who went ahead with the solution, so you can see first-hand the typical journey from start to finish, exactly what the solution looks like, and the benefits experienced since the 4G mobile broadband has been in place.





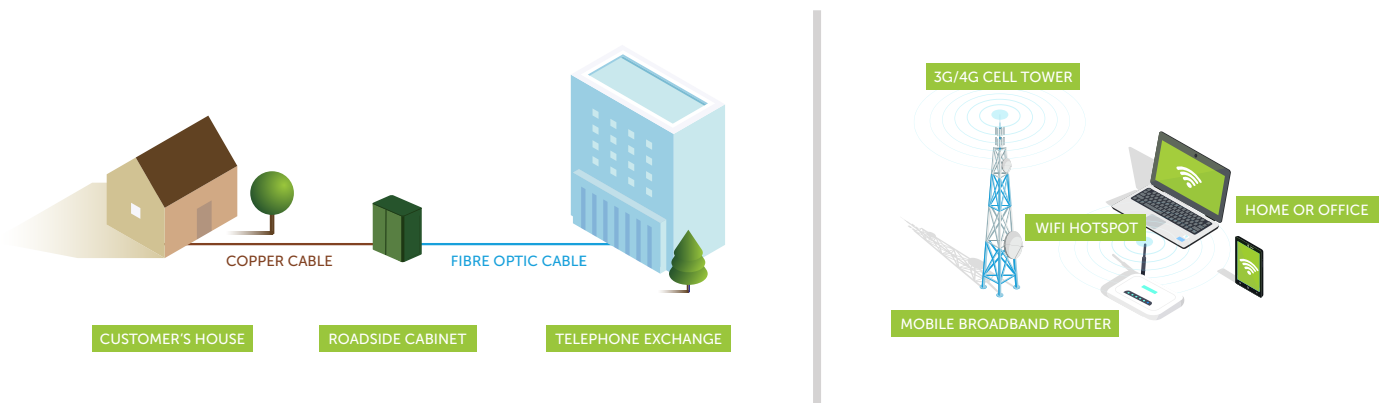
“It has immediately proved useful as I had to download some excellent photos from a photographer done recently which have very large file sizes. This takes me hours and hours and gets very frustrating so I often have to resort to them being sent on a USB stick by post! Today, very quick and means I can start using the photos right away for Social Media promotion etc”

Winery Business Owner

What is 4G mobile broadband and could it work for me?

What is mobile broadband?

Instead of connecting your home to the internet in the conventional way using fibre or copper cables, 4G mobile broadband uses wireless mobile networks. This works in the same way as you may connect to the internet when using your mobile phone outside. The mobile signal is picked up using either an external antenna, or directly to a router. Wi-Fi connectivity is then projected round your house or business, in the same way as conventional broadband. The UK has four Mobile Network Operators (MNOs) who can provide mobile broadband; these are Vodafone, EE, Three and O2. A number of consumer suppliers sell mobile services over the MNOs' infrastructure. Well known names include Tesco Mobile, Sky and Giff Gaff but they will all be selling services provided at source by one of the MNOs.



Could this work for me, and who may be the best provider?

As long as there is 4G mobile connectivity in your area, there is a good chance this solution could work for you. Different mobile network operators (MNOs) will have different levels of coverage and signal strength dependant on the area. We would suggest checking the coverage in your area from each of the four MNOs to see if this is a viable option for you, and to determine which provider may give you the strongest connection. Please continue on to the next section for step by step instructions on how to carry out these tests.

It's also worth noting that the definition of 'good mobile connectivity' could vary depending on the broadband speeds you currently experience, i.e. even if the mobile connectivity is poor in your area, it may still help you to see improvements compared to, for example, an existing broadband connection with almost non-existent speeds. Even if your existing mobile connectivity is poor you may still see improvements using a 4G mobile booster. This could make a big difference to your online experience particularly if your existing broadband speeds are slow.

My current broadband speeds, and whether this could improve my connectivity

Before proceeding with the guide to determine what speeds you may be able to expect from 4G Mobile Connectivity, it's worth completing a speed test to determine your current existing broadband speeds first.

We would recommend completing the test in the same room as your Wi-Fi router, as this will give you a better understanding of the actual speeds you're receiving, before the signal is potentially reduced as it's projected through your property. If you are getting 30Mbps or above, then it's unlikely 4G mobile broadband would provide any significant improvements. A 4G Solution is best suited to households receiving very poor broadband speeds, and are unable to improve the speeds either by having an engineer visit to test the line, or by switching provider.. Also, when it comes to testing the speeds you could receive through 4G mobile connectivity, it's essential you have something to compare back against to determine if the 4G mobile connectivity would provide improved speeds, or whether you'd be better off sticking with your existing broadband.

To test your existing broadband speeds, please follow the instructions below:

- Ensure your device is connected to the Wi-Fi of the broadband you wish to test.
- When completing the broadband test, it would be ideal for your device to be cabled directly to your router from your device to remove any potential issues with the Wi-Fi signal within your property. To do this, however, you would need a network cable and for your device to have the relevant port.
- When connected, it is time to test the strength of this. You can do this by typing www.fast.com in to your URL on your device's browser. This site will automatically pick up and test your connection. It's worth carrying out this test multiple times in a day, as speeds can vary and reduce during peak times.
- If your speeds are poor and you would like to proceed with exploring a 4G mobile solution, make a note of the average speed you received so that you have something to compare back against when testing 4G mobile connectivity.

4G Mobile Connectivity Testing

Is mobile connectivity available in my area and at what speed

To identify whether 4G Mobile Broadband would be suitable for you, you would need to conduct 4G mobile connectivity testing to determine if mobile connectivity is available in your area. This will tell you the minimum speeds you may expect to receive, and who the best provider could be. These tests can either be done professionally, or by yourself, with clear step by step instructions provided below on both. Whatever your preference. It's worth noting that any desktop assessment would not be 100% accurate, and that practical tests would always be recommended before proceeding with any installation, which is detailed further on in the guide.

Professional Desktop Assessment – how to request and what to expect

Professional desktop assessments can determine expected mobile coverage, expected speeds, closest cell tower, and best mobile provider for your exact location. Tests are normally available through most mobile connectivity specialists. The Wi-fi specialist West Sussex County Council used, who successfully carried out the practical testing and installation at the Albourne Estate (as detailed in the Case Study section of this guide), advised that they provide these desktop assessments for £25. The outputs are highlighted in a written report to the client. Other providers are available and may price differently, please see the price quoted as a guideline.

Professional onsite assessment and test – how to request and what to expect

A professional onsite assessment and test would provide the most comprehensive and reliable results, although this is not always deemed to be required. You may decide to go down this route if you have completed your testing which has concluded in mixed or ambiguous results, and want peace of mind that this solution would be successful. Onsite testing, which is normally offered by most mobile connectivity specialists, is normally conducted using a 4G external antenna mounted on a pole. This provides outputs detailing signal strengths from each of the four mobile network operators. The engineer conducting the assessment will also test from different sides of the building to see how this affects signal strength. Your engineer can give you an indication of the results on the day, however, you would also expect a full written report to detail the results from the test, expected speeds, best mobile provider for your location, and the closest cell tower any fitted antenna would face, in order to be in line of sight of it. A full comprehensive onsite test and report, although very reliable, can cost around £400.



DIY Desktop Assessment – how to complete a desktop assessment yourself

To complete the desktop assessment yourself, we would recommend carrying out both an 'Ofcom Coverage Check', and an advanced assessment using 'CellMapper'. Both tests are detailed below.

DIY Desktop assessment Test 1 – General Ofcom checker

Firstly, it is worth getting a rough view of what coverage may be available at your property using the Ofcom Mobile Coverage Speed Check application. To do this please follow the instructions set out below:

- Click and open this link <https://checker.ofcom.org.uk/en-gb/mobile-coverage> or type it into your browser.
- Enter your postcode and select your address
- Ensure the purple tabs are set to 'indoor'
- Using the 'data column', check all four providers. If a green tick is showing, that is a good indication that you may be able to get a 4G mobile data connection within your home. Make a note of any providers that are shown with a green tick. If none are showing, change the purple tab from 'indoor' to 'outdoor'. Then, once again, check all four providers for a green tick, but this time focus on the 'enhanced data' column and make a note of any shown with a green tick.



Results are predictions and not a guarantee. Actual services available may be different from results. [More information](#)

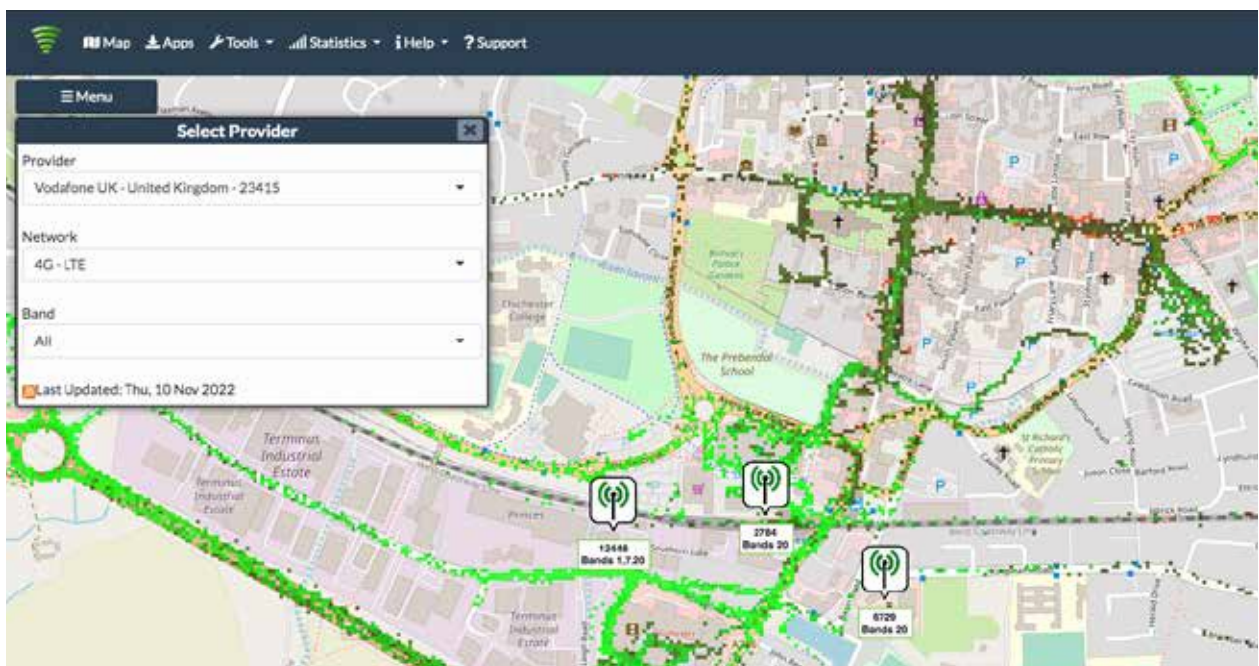
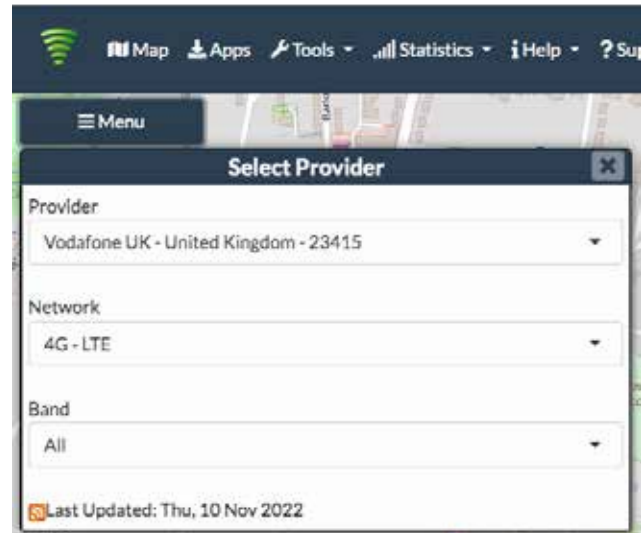
This table shows the mobile availability in your area.

Provider	Voice	Data
EE	✓	✓
Three	✓	✓
O2	✓	✓

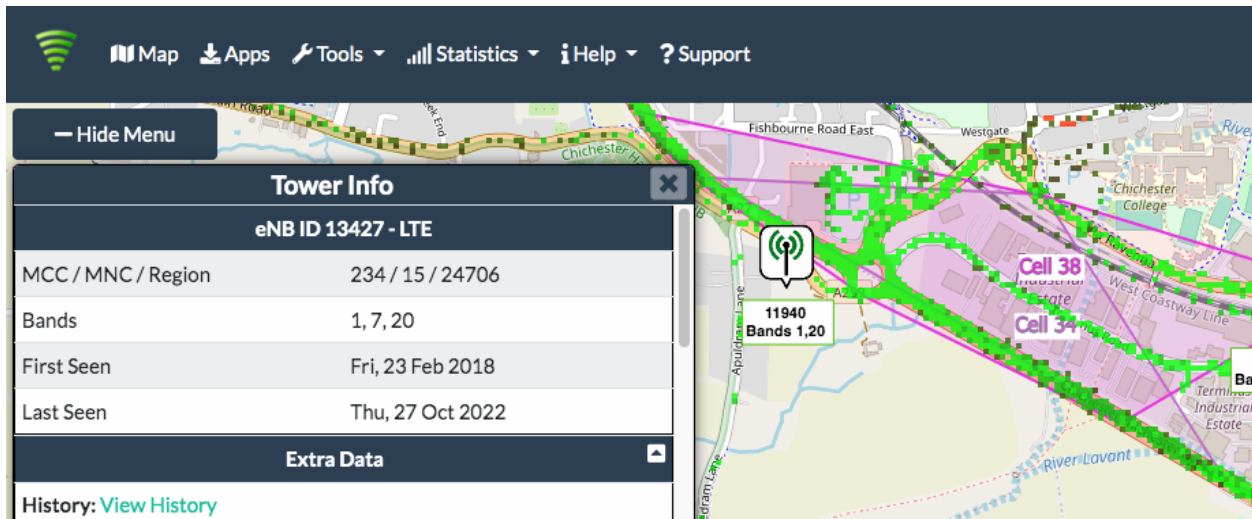
- You should now have a note of any providers that were showing a data connection available from either indoors, or from the outdoors if no others were found. You are now ready for the next test. If no data connections were shown for your premises both indoors and outdoors, still please continue to the next test. This is only a general coverage test so is not perfectly accurate, and does not necessarily mean there won't be a solution for you.

DIY Desktop Assessment Test 2 – CellMapper Coverage Check

- Click and open this link: <https://www.cellmapper.net/map>
- Manually find the location of your house on the map, or use the 'location search' which can be found on the left side of the screen when scrolling down. If doing this manually, this will initially involve zooming out to get a sense of where on the map you are.
- Then, on the left hand side of the screen, you will see the selection table. Under provider, you will need to scroll down to 'United Kingdom', and will need to test all four of the mobile network operators which are Vodafone, EE, O2, and Three. For clarity, in the provider list, these will be shown as 'Vodafone UK', 'O2-UK', 'EE', and '3UK', excluding the number codes. As you test each of these, with further instruction shown below, you will set 'network' to '4G- LTE', and 'Band' to 'All Bands'. The 'network' and 'band' will remain the same throughout all tests when flicking between the providers.
- Now, under 'provider', select Vodafone UK as your initial provider to test against, and ensure the 'network' and 'band' are set as instructed. The confirmed and unconfirmed cell masts will be represented as green or red circles respectively, as shown on the map below.



- You will now need to click on each cell tower within the vicinity of your property to determine their projected coverage. The projected coverage will be shown as a highlighted area, or a series of highlighted areas. Coverage will be shown within lined areas and in different colours depending on the radio frequency bands used by each MNO. You may notice that one or more MNO provides services using the same band from the same mast. This is because MNOs are encouraged to share equipment to minimise the numbers of masts and cell towers at locations. You will be checking whether projected coverage covers your property. If so, make a note of the provider. If you have clicked on a cell tower, and want to get back to the general left hand column to be able to change provider, just click 'general' in the top left corner.



- If you were also planning to complete the installation yourself, its also worth noting the direction of the tower in relation to your house, to know which way to face your antenna. For example, if your property is to the East of the cell tower, then make a note of this so that you know to install the antenna on the West side of your house, as this would be the side facing the cell tower. This will be covered in further detail later in the guide.
- Once you have completed the above steps for Vodafone, repeat that for the three other providers, ensuring you make a note of any providers that seem to provide coverage over your property.

Desktop Assessments – Initial test outcomes

After completing a desktop assessment or through a professional desktop assessment, you should now have a good idea whether you may be able to get a 4G connection at your property and the likely best provider.

Although the desktop assessments may give you some ideas of what you could expect, we would still recommend that you proceed to the On Site Assessment and Test section. This will detail how to perform practical tests, and give you 'real world' results.

DIY Onsite Assessment and Test – how to complete a practical assessment yourself

Now that you have completed the desktop assessments (either yourself, or through a professional) and have a good idea on what connectivity may be possible, and the best potential providers, it's time to try a practical test for final confirmation. This DIY On Site Assessment uses a mobile phone sim card inside a mobile phone. A sim card is the little plastic card with an embedded microchip which sits inside your mobile phone. Your mobile provider will have given this to you when you took out a contract with them for a service. The card allows you to send and receive text and voice messages as well as connect to mobile internet services (if data is included within your package). As the connectivity your phone uses is the same used for mobile broadband, this is the perfect way to determine what connectivity you can get, and which provider could give you the strongest reception. Unfortunately, your sim card in your phone will only be linked to one provider, so you may need to find ways of testing other providers. Ways of testing other providers are detailed further below. Each sim card will represent and test a different provider, so out of the four providers, how many you decide to test is up to you, and may be determined by your results from the initial assessments. You may have only found one mobile network operator that appears to be viable and so you might choose to only test the one. Alternatively, you may have had all four mobile network operators appearing to be able to provide a connection, and therefore you could decide to test all four to determine which could provide the best strength connection.

Options to find suitable network sim cards to enable practical test

All the options listed below may be potential options to source suitable sim cards once you have determined the mobile network operator/s you wish to test. All mobile providers operate over one of the four mobile network operators infrastructure. So, if you're on GiffGaff for example, they are actually just providing the service over O2's infrastructure. This is important to note, as it is the four mobile networks operators you are looking to test against, so if you were testing a Giff Gaff sim card, you'd actually be testing O2. You will likely need to understand which providers use which networks. For this to be determined, please use this link:

https://en.wikipedia.org/wiki/List_of_United_Kingdom_mobile_virtual_network_operators

This details 'brand', which shows who the 'provider' is, as well as the 'Host Networks', which will be one of the four mobile networks operators i.e. O2, Vodafone, EE and Three.

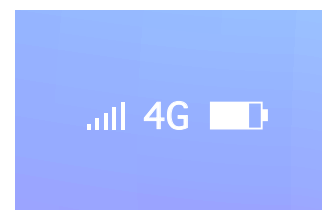
Suitable ways to test using sim cards:

- Using your own mobile phone and current service provider: it may be that only one mobile network operator seems viable, which is possibly the provider you are using currently for your mobile phone service and connection. Remember, if your 'provider' is not one of the four mobile networks operators mentioned, use the link above to determine which operator you would be testing against.
- Using friends and families mobile phones: it may be that you have friends or family who currently use different networks and may be willing to come to your house to test the connectivity for you. If you don't know which networks they're on, it may be worth asking to see if they can assist.
- Purchasing different sim cards to insert in to your mobile phone to carry out the tests: if the options above aren't viable for you, it may be that you have to purchase 'pay-as-you-go' sim cards for the mobile network operators you wish to test. They can be inserted in to your mobile phone to then allow you test the connectivity of each. Getting a sim card with the data required to test the connectivity will often cost around £10 each, so it may be worth being selective in regards to which providers you wish to test for. Sim cards can be purchased from any of the four mobile network operator's stores (Vodafone, EE, Three, O2), or online. These four operators usually also have a 'live chat' function on their websites that you can use if you have any questions.
- Sometimes, your mobile phone may be locked to only allow one provider. If this is the case, or if you are unsure, contact your current provider to ask how this can be unlocked for you to be able to carry out the tests. Alternatively, you may have a friend or family member who does have an 'unlocked' phone who may be able to help if they are willing to use different sim cards in their phone to test the signal strengths for you.

Performing the practical test

Now that you have decided which mobile network operators (MNOs) you're going to test, using the section above, and have the relevant mobile phone and sim card/s available in front of you, it's now time to carry out the DIY practical test. You will have to follow the instructions below for each sim card (MNOs) you are going to test for.

- If you have an existing Wi-Fi (or wireless) broadband at home, ensure it is switched off, either by the modem or mains, or by disconnecting it on your phone. Ensure that your mobile data is switched on, so you are connected to the mobile network only, which is the connection we are testing.
- Once you have done this, you will hopefully see a 4G, or possibly 3G, icon appear at the top of your phone screen which indicates you are picking up some sort of mobile connection. An example of what this could look like is shown below, with the symbol usually appearing some where along the top of your phone. Some providers results will show as 'H+'. H+, in summary, is an advanced 3G technology, and most users wouldn't see much difference in quality between this and 4G.
- If this does not appear, try moving to different areas of the house to find a signal. Once you have a signal, proceed to the next step. If no signal appears, please then try again from outside your property. Please do, however, still ensure you test the other viable providers though to see if you get different results.
- Now that you have a confirmed signal, it is time to test the strength of this. You can do this by typing www.fast.com in to your URL on your mobile phone browser, or just by searching it on Google. This website will automatically pick up and test your connection. It is worth carrying out the tests in different locations in the house to see what location gives you the strongest connectivity.
- Please ensure you carry out the tests for all providers you identified in the initial tests, and make a note of the results for each, both indoor and outdoor. If you can get a signal from outside, but not inside, it may only be worth considering a 4G Mobile solution that uses an external antenna, which is detailed later in the guide, as this would probably mean you would require an antenna to pick up a signal from outside to bring it in to the house for this particular provider.



I've done my tests and know my expected speeds, but what do those speeds really mean for me?

Connectivity test strength – download speeds	What this means
No connection	This may mean you are unlikely to ever pick up a decent mobile connection, even with additional support from a 4G antenna etc, although you may wish to go down the route of a professional onsite assessment to be sure, as an external antenna would be more powerful, and likely installed at a higher height than the mobile phone test would have been taken at.
Under 10Mbps	If your indoor connectivity is below 10 Mbps, you may want to consider an external antenna to maximise the strength of connectivity you can receive. If you could only pick up a connection outside, then an external antenna is probably your only suitable 4G solution.
10Mbps to 30Mbps	This is considered decent, but may limit you with some activities depending on how you plan to use the internet (see information below). If you don't think this would be sufficient, or you could only get these speeds when testing outside, then please consider an external 4G antenna to maximise the strength of connectivity you can receive.
30Mbps to 100Mbps	A 4G Mobile router should be sufficient for most standard online activity, with no additional external antenna needed.

Although we have tried to provide a rough guide on what the speeds mean, with further detail and examples below, whether you proceed or not with this solution will also depend heavily on the speeds you are experiencing currently. 30Mbps might represent superfast speed, however, it would still not be worth pursuing if your current broadband connection is 50Mbps for example. Alternatively, 10Mbps may be deemed relatively poor, but if your current connection speeds are almost non-existent, then it would still probably be worth going forward with a 4G solution.

To put the speeds in to context, streaming services such as iPlayer or Netflix require a stable connection of around 2-3Mbps per viewer for a reasonable quality of video. This would rise to around 4-5Mbps for HD viewing. Gaming requirements would be dependant on the game itself and the console/pc being used. In an example family of 2 adults and 2 children each consuming their own online activity, 2 streaming online video, 1 gaming, and 1 checking emails/social media, a minimum requirement of at least 10Mbps would be needed. Its also worth noting that mobile strength can vary depending on a number of factors, for example, the weather.

The speeds noted are downloads speeds, but you would also want to check your uploads speeds when conducting the testing. Upload speed would be relevant when transferring data from your device to the network i.e. uploading photos to social media, or live video calls. Upload speeds are going to be quite important for anyone with Zoom/Teams style calls, where 2Mbps upload speed is going to be the real minimum needed, likewise for VOIP telephone calls.

4G Solutions – what's available, and what could work best for me?

Below are detailed a number of 4G solutions that you may wish to consider. Which solution you decide to proceed with, if any, would likely be determined by the results of your testing assessment, and how you wish to use the solution. It is also worth noting that, if you have had a professional assessment, that you should seek advice from them as to the best option to proceed with. For each solution, we have detailed what exactly the solution is, how it can be used, who its suitable for, and the cost. Although for peak 4G mobile performance, we would always recommend a router with an external 4G antenna; we appreciate that the upfront costs would not be viable for all, so have listed all 4G mobile solutions that may be able to help.

Omnidirectional External Antenna with 4G mobile router

Is a 4G external antenna suitable for me?

If you are receiving no or slow signal indoors, but are getting connectivity outside, then a 4G mobile router (also detailed further in the guide below) connected to an omni-directional external antenna would probably be your only 4G option. Not only would this option represent the best 4G solution for a property with poor signal, it would also provide the best 4G connectivity possible, so would also be recommended if you are looking for the highest speeds and best service possible.

Due to what can be a relatively complex process required to install the antenna, and link it to the router inside the building, we would recommend seeking a professional to carry out the installation. Although it can be done yourself, we will not be detailing this step by step within the guide, although a lot of information included may still be useful. Whether you get it professionally installed, or do it yourself, a data sim from your chosen mobile provider would still be required, to go into the 4G Mobile router and provide the service. For unlimited mobile data, you can usually get these for around £25 per month, however prices can vary, and can be reduced by lowering the amount of data you can use within the package.

Omnidirectional external antenna summary: Omnidirectional antennas are often small and compact. They are installed on the outside of the property, as high as possible, to maximise the signal through to the router. If purchasing yourself, most will often come with the appropriate cable to enable you to connect it up to your router inside your property. You will just need to ensure that the router you have has the appropriate antenna ports; if you're unsure, you can ask the provider or speak to a professional. Omnidirectional antennas are not focused in a single direction, so you don't have to worry about making sure your antenna is pointing in the perfect direction, however, it is still essential that the antenna is pointing generally towards the most effective chosen cell tower, and is installed on the correct side of the property. If you do plan to install the antenna yourself, you should refer back to the information you collected when completing the desktop assessment, for example, cell tower locations, etc.



Professional Install – Everything you need to know, or ask for from a potential provider

Most 4G mobile specialists will offer the installation and set up of a 4G external antenna with a 4G Mobile router. Allowing a professional to complete the work often takes a lot of the hassle and stress out of completing the works, however, there is still a number of areas where you'd want to know the details, some of which we have listed below:

- **Price:** You should always ask for a price upfront, and be sure you know exactly what is included within that i.e. installation time, materials etc. When conducting the installation for our case study, detailed further below in the guide, the standard price from our chosen supplier was £625, excluding VAT; this price could be used as a baseline for yourself when requesting quotes from different providers. This cost included everything that was required for a standard installation, for example, engineer installation time, and materials i.e. the router, the relevant cabling, and the external antenna and mounting equipment.
- **Equipment:** You should ensure you know exactly what equipment is being installed, and ensure you are happy with the quality. Its also worth noting that some 4G antennas are 5G ready, meaning they work on both 4G and 5G. These antennas are preferable as it means you could switch over to 5G when/if it becomes available.
- **Warranty:** You will want to know the warranty being offered on both the installation itself, and the equipment – you should expect a minimum of 12 months.
- **Support:** You will want to know what support is offered going forward – in the case study example, the router performance can be monitored remotely by the supplier who carried out the installation, meaning if the client experiences issues, they can report it back to the supplier for the supplier to determine whether it's an equipment issue.
- **Professional advice on supplementary work:** There may sometimes be an opportunity for the supplier to provide additional supplementary work, above and beyond the initial standard installation, which could enhance the benefits you could receive. As detailed in the case study, our supplier recommended an additional access point, which then provided Wi-Fi across the whole business area which could then be used by business guests, rather than for sole use in the office. Although this meant an additional cost of £250, the additional benefits realised were significant.

DIY Install – General advice and pointers – (Not recommended, and please do consider Health and Safety if you are to complete any installation yourself)

As installing an antenna and the subsequent tasks can be complex, and with health and safety risks, we would recommend seeking professional advice and not attempting to carry this out yourself. For anyone that feels confident completing this task themselves, we have listed some general advice and pointers below.

Equipment

- Ensure you have all necessary equipment to carry out the full installation, including the external antenna, necessary mount, appropriate cabling and router.
- Ensure the router you choose has the necessary antenna ports so that you are able to connect it to the external antenna.
- Some routers require configuration as part of the set-up process – this is usually detailed on the provider’s site, and instructions/guides often provided, but it may be worth checking with the supplier if you’re unsure.
- Some routers are linked to specific providers – generally it’s recommended that you look for neutral routers to enable flexibility with providers.

Installing the 4G antenna

- Ensure you are installing the antenna on the most appropriate side of the property, facing the closest cell tower of the provider you plan to use – as detailed earlier in the guide, Cellmapper is a great tool to determine cell mast locations.
- Typically, planning requirements allow you to install an antenna to the height of the apex of the building under permitted development. It’s recommended to get the antenna to the height of the apex of the building where possible, as the signal is generally stronger the higher the antenna is placed.
- Try to install the antenna as close as possible to where the router will be placed within the building – this will mean an easier installation, and will probably avoid you having to use extended cabling to get from the antenna to the router.



4G mobile router, excluding external antenna

What is a 4G Mobile Router and is it suitable for me?

A 4G mobile router serves the same purpose as conventional Wi-Fi broadband, whereby the router picks up a connection and projects it through your house for multiple devices to connect to it. Compared to the 4G Dongle, the router would be much more suited to someone who has various devices they want to connect up, or other people in the household wishing to use the router. Unless connected to an external antenna, this would once again be relying solely on mobile connectivity received inside the building, so you would need to ensure that your connectivity is strong enough inside to ensure a good experience using 4G mobile over a router. If, after setting this up, your connection struggles with the usage required, or you experience too many issues and want to strengthen it, you should consider a 4G antenna, which is detailed further down in the document. It's worth noting that not all routers have the available ports to connect an antenna, so this is something you would want to check when purchasing.

Where can I purchase a 4G Mobile Router from?

4G Mobile Routers can be specific to a provider, or neutral. If you are buying one that is specific to a provider, you would need to purchase one that aligns with the best provider you identified during your DIY practical test. However, 4G Routers are easy to get hold of, and will be available in all four of the mobile providers stores and websites (i.e. Vodafone, EE, O2, Three), as well as many models available online. If you would like to use one direct from a mobile provider, simply google '4G Router' with the name of your chosen provider and you will see appropriate links to follow on to their websites. Advisors would be happy to help you in store, and a live chat function is often available on their websites if you have any questions or need further assistance. Some 4G routers, especially when more specialised, will require some manual configuration; this is another question to keep in mind when buying your router. A Robustel 4G router was recommended, and used, by the company who completed the installation used in our case study.

How much will it cost?

The router itself will generally be a one-off payment, typically ranging between £60 and £200. To actually receive connectivity through it, you would still require a sim card with data. Depending on how you plan to use it, you may feel more comfortable having unlimited data without the worry of running out. Mobile providers do provide a monthly contract for both the router, and the data – prices can vary, but it would generally cost around £30 to £50 a month depending on how much data you require. Typically, if you enter in to a longer term deal (i.e. 24 months), there usually isn't any up-front costs. If you decide to pay for a router up front, then your monthly costs would only need to cover mobile data, so would likely be lower.



4G Dongle - Only for personal use to be used in a single device (would not be considered mobile broadband as only works on an individual device)

What is a 4G Dongle and is it suitable for me?

A Dongle is a small piece of computer hardware which slots in to the USB port on the side of your computer or device to connect it to the internet via the mobile network in the same way as your mobile phone would connect. Please see the image above as an example of a 4G Dongle. A 4G Dongle does have limitations in that it can only connect the device it is plugged in to at any one time, so would not be suitable if you are looking for something that would work in a similar way to a home Wi-Fi broadband service. It is however, very transportable and does not have to be plugged in to any mains socket or telephone port, meaning you can use this anywhere in your house (or elsewhere) where your connectivity may be strongest. You would also need to have ensured that your connectivity was strong enough inside your house, as this would not be attached to an external antenna so would rely on the connectivity received from inside your house, or the building where you are working.

Where can I purchase a Dongle from, and how much will it cost?

Dongles will be specific to a provider, so you would need to purchase one that aligns with the best provider you identified during your sim card test. However, Dongles are easy to get, and will be available in all four of the Mobile Network Operators stores (i.e. Vodafone, EE, O2, Three), as well as online on their websites, and through consumer service providers. Simply Google '4G Dongle' with the name of your chosen provider and you will see appropriate links to follow on to their websites. Advisors would be happy to help you in store, and a live chat function is often available on their websites if you have any questions or need further assistance.

How much will it cost?

Depending on how you plan to use it, you may feel more comfortable having unlimited data without the worry of running out. A Dongle with unlimited data would, generally speaking, cost around £30 a month over a 12 month contract, with no upfront costs, however, you will likely be able to get it cheaper if you are happy with less data, or if you can find a deal with your chosen provider. This data package would be needed in addition to your existing mobile phone package, unless the provider allows you to 'gift' a data allowance between the devices; this could be something you may wish to speak to your current provider about to assess options.

4G Mobile Broadband Trial Case Study – Albourne Estate Vineyard

Purpose of the trial

The purpose of the 4G mobile broadband trials was so that 'real world' examples and information could be used to shape the user guide, and give you the most up to date, useful information possible. In the process of doing this, we have managed to help local businesses, as detailed in this case study, and test the effectiveness of this solution for ourselves.

Summary

The Albourne Estate Vineyard came through to us as a business that was experiencing ongoing connectivity issues, and who were looking to improve their connectivity speeds and enable new and more efficient ways of working. The Estate Vineyard had no existing broadband connection, and were relying on a simple mobile solution, using a 'MiFi' style box within their office. We completed some desktop assessments which reinforced the idea that the Estate Vineyard was located in an area with good 4G mobile connectivity, and could significantly benefit from a comprehensive 4G solution, using a 4G external antenna connected to an industrial router. The next stage was to work with our chosen Wi-Fi Specialist supplier, Geekabit, to carry out an onsite test and assessment.

Professional Onsite Test and Assessment

Upon arrival at the site, the Geekabit Engineer worked with the owner to understand where the Wi-Fi coverage that comes from the mobile broadband router is predominantly required. The owner advised that there was an office located in the west side of the building, and that this was the area where the Wi-Fi would be required the most. This information was really useful to the supplier, and gave them an understanding of where the router will be placed, and therefore, a general idea of where the external antenna would need to be installed. Its important that the distance between the external antenna and the router is kept as short as possible, as signal strength can be lost while data is transferred between the two via cabling. Not only did this give the supplier a general view of whereabouts on the building the antenna would be installed, but also of the best areas to carry out the mobile connectivity testing with this in mind.

To carry out the test, the supplier used a specialist piece of testing equipment, with a 4G antenna mounted to a pole, which could pick up and present the different signal strengths from the four Mobile Network Operators. Tests were carried out in a few different locations surrounding the office area, to test signal strength from different sides of the buildings. With these readings, and subsequent research done by the supplier, a report was then produced to detail the findings. The comprehensive outputs report included:

- How the test was carried out and the equipment used
- An overview of the results
- A recommended provider and solution
- Details of nearest cell tower
- Details of expected speeds
- Details of other providers in the area
- Recommendations on supplementary work to maximise benefits
- Details on the heights of hills and geographical blocks between the cell tower and the property, and the different heights of the building compared with the cell tower.

In this example, it was recommended the business proceed with Vodafone. Vodafone provided the highest strength signal during the testing, and had the closest cell tower to the business. Although O2 were considered, as O2 had more cell towers in the area which could provide more resilience, the recommended provider was Vodafone due to an expected download speed of 40Mbps, compared to 20Mbps with O2.



Whilst on site, the business owner also stated that it would be great if there was a way for the Wi-Fi to also be able to reach the visitor area of the building, and the outside patio, so that customers could also use and benefit from the Wi-Fi, which they weren't able to do with their existing solution. The supplier recommended an additional access point, i.e., a second piece of equipment that could project the Wi-Fi, that would run from the new router via cabling, out to the visitor area.

With the full details obtained, and a clear recommendation from the supplier, the Estate Vineyard was happy to proceed with the installation, with the additional access point included.

Installation

Two supplier engineers were present on the day of installation; one to carry out router configuration work, and the other to install the external antenna, and complete the cabling work.

The first action for the engineer was to complete a survey to determine the exact location to install the antenna, and the best route to run the cabling from the antenna to the router inside the building, and then on to a newly installed access point within the visitor area. Not only did they consider the most effective route for the technology, but also the route that would have the cleanest finish, and ensure any new equipment and cabling was as inconspicuous as possible. The suggested antenna location and cabling routes were discussed and agreed with the business owner before any work began. Once everything was agreed, the installation began.

The engineer, using a tall ladder to get to the point of installation (as shown in the image to the right), fixed the mounting pole and antenna. This was fixed at the highest point possible in line with planning restrictions, to ensure the best line of sight to the nearest cell tower being targeted. The cable was then fed down from the antenna, into a pre-existing hole into the building, used for other utilities and cabling. This well selected route meant no additional holes were required to get the cable into the building, and kept the work as neat as possible.

Using a cable rod, the engineer first ensured that there was enough space through the existing hole to feed the cable, and that the rod came through on the other side of the building to the expected location. Once they had confirmation, the cable was then fed through with the cable rod into the building, where it could then be pulled through. Once in, the engineer used existing cable runs to seamlessly take our cable through the building, and up in to our desired location, where they could then connect it up to the router inside the office.

In parallel, the router was being configured to enable optimal performance. Configuration covers a number of standard elements, but the engineer had also identified that the Estate Vineyard's existing router had been flicking between 3G and 4G which was hampering performance, so configured the new router to stick to 4G only.

The final stage of the installation was to install the new Wi-Fi access point in the visitor area, and connect this to the router via cabling. Once again existing cable runs were used, with a small hole drilled to take the cable into the visitor area, and create a seamless, wire-free finish into the access point installed.

Summary of equipment used:

- Robustel R1510-4L 4G Router with Power Adapter
- Poynting 5G XPOL-1-V2-21 Antenna (also work with 4G)
- External Mounting Equipment
- Data Cabling
- Ubiquiti UniFi AC-Lite Access Point

Warranties Provided:

- One year warranty on the installation itself, with manufacturers warranty covering the equipment, which is also a year warranty.

Immediate benefits/results/feedback

- Wi-Fi is now available throughout the entire office, customer area and patio
- Wi-Fi can now be accessed by customers, which can also be great for business promotion as customers share pictures and experiences on social media, etc
- Stronger, more reliable connection
- Enables reliable card payments in customer area
- Has enabled new more efficient ways of working.

