Connecting Your Farm

A Practical Guide to On-Farm Broadband in Scotland

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Why Connectivity Matters

Access to reliable, high-speed internet is becoming as important to farms as roads, electricity and water. Connectivity is the backbone of modern agriculture, supporting everything from record keeping and compliance reporting to automated machinery and real-time weather monitoring.

Good connectivity allows Scottish farmers to:

- Adopt precision agriculture techniques like GPS-guided tractors, variable-rate input applications, and remote irrigation control.
- Utilise cloud-based platforms for herd management, financials, health tracking, and environmental monitoring.
- Improve safety and wellbeing, enabling video calling and remote healthcare access for isolated farms.
- Save time and money by reducing travel, improving logistics, and automating routine monitoring tasks.
- Attract and retain staff, especially younger workers who expect reliable internet for work and personal use.
- Meet regulatory requirements by submitting digital forms, mapping data, and cross-compliance submissions.

Connectivity is not just about getting online at the farmhouse; it's about enabling the whole farm business to run more efficiently, more sustainably, and more safely. Whether you're a crofter, dairy farmer, or managing thousands of hectares, the right connectivity solution can transform how your business operates.

This guide helps you explore and evaluate the best connectivity options available in rural Scotland, tailored to your specific farm setup and future plans.

1.Assessing Your Needs & Location

Before choosing a broadband solution, take stock of your situation:

Key Questions to Ask:

- **What's available now?** Use Ofcom's Broadband and Mobile Checker to see what services you can already access.
- **What are you trying to connect?** Home office, sheds, remote fields, sensors?
- **What do you need to do online?** Video calls, live data feeds, remote equipment monitoring?
- **What's your terrain?** Flat, hilly, wooded? Line of sight matters.
- **What's your budget?** Upfront and ongoing costs.
- **Do you want a DIY or professionally installed setup?**

2.Understanding Your Options

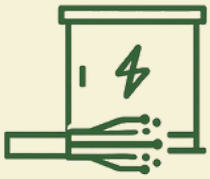
Fibre to the Premises

Choosing the right connectivity method depends on your location, needs, and infrastructure. Here's a deeper look at each option to help you evaluate what's right for your farm:

Fibre to the Premises (FTTP)

FTTP is a high-performance option where fibre-optic cable runs directly from the local exchange to your farm. This provides a stable, high-speed connection that doesn't degrade with distance.

- **Speeds:** Up to 1 Gbps (both upload and download).
- Installation: Professional install required. May involve digging across fields or tracks to reach buildings.
- **Reliability:** Excellent – fibre is not affected by weather or distance.
- **Cost:** Package prices vary depending on speed chosen. Can require expensive groundworks to install if not already available in your area.
- **Ideal for:** Farms running multiple devices, video conferencing, cloud backups, and advanced agri-tech systems like IoT sensors, remote cameras, or farm management software.



Fibre to the Cabinet

Fibre to the Cabinet (FTTC)

With FTTC, fibre reaches a roadside cabinet near your property, and copper wiring completes the final stretch to your farm. Speeds depend on your distance from the cabinet.

- **Speeds:** Typically 30–70 Mbps, but can be lower with longer copper runs.
- **Installation:** Uses existing phone lines; generally easier and cheaper than FTTP.
- **Reliability:** Good, but signal can degrade over distance or old wiring.
- **Cost:** Generally low; often included in standard broadband packages.
- **Ideal for:** Moderate online use – such as email, browsing, streaming, and limited cloud applications.

Fixed Wireless

Fixed Wireless Access (FWA)

FWA connects your farm to a broadband provider using radio signals instead of cables. A dish or antenna is mounted on your building and must have a clear line-of-sight to a base station or mast.

- **Speeds:** Typically 30–100 Mbps depending on provider and conditions.
- **Installation:** Antenna and receiver installed on your property; may require alignment.
- **Reliability:** Weather and obstructions (like trees or hills) can impact signal quality.
- **Cost:** Moderate; often community-run or subsidised.
- **Ideal for:** Locations with no fibre or mobile coverage, but good sightlines to a nearby mast.

2.Understanding Your Options

4G Router

4G Routers / Mobile Broadband

This option uses the existing 4G mobile phone network to deliver internet to your farm via a router and SIM card. Performance can be boosted with an external directional antenna.

- **Speeds:** 10–100 Mbps depending on network and signal strength.
- **Installation:** Simple plug-and-play router; antenna adds performance.
- **Reliability:** Good in areas with strong signal; variable in remote locations.
- **Cost:** Affordable monthly plans; flexible and quick to deploy.
- **Ideal for:** Farms within decent 4G coverage areas, or as an option while waiting for fibre.

Starlink

Starlink (LEO Satellite Broadband)

Starlink uses low-Earth orbit satellites to provide high-speed internet with lower latency than traditional satellite options. It can deliver fast broadband even in rural and isolated areas.

- **Speeds:** Typically 50–250 Mbps with low latency.
- **Installation:** DIY kit with motorised dish; requires unobstructed view of the sky.
- **Reliability:** Excellent in remote areas with no terrestrial coverage.
- **Cost:** Higher monthly fees and equipment cost (~£75–£90/month).
- **Ideal for:** Remote or island farms where fibre, mobile, and FWA are unavailable or unreliable.

Community Broadband

Community Broadband Projects

Some rural areas band together to create or extend local broadband networks, often supported by grants or social enterprises. These initiatives can deliver high-quality service where commercial providers haven't reached.

- **Speeds:** Varies – from 30 Mbps to full-fibre speeds depending on setup.
- **Installation:** Usually coordinated via local volunteers and contractor support.
- **Reliability:** Depends on provider and infrastructure; can match commercial providers.
- **Cost:** Typically lower ongoing costs; up-front investment may be needed.
- **Ideal for:** Remote or underserved communities willing to collaborate for better access.

3.Choosing a Provider and Plan

Once you've identified the right type of connectivity for your farm, it's time to choose a service provider and plan. This can be overwhelming, especially in rural areas where fewer options may be available. Here are some practical tips:

Check What's Available

- Use tools like Ofcom's checker to see what providers and technologies are available at your location.
- Ask neighbours what they use—local feedback is invaluable.

Compare Plans Carefully

- **Speed:** Look at advertised speeds vs. actual speeds reported by users in your area.
- **Data Allowance:** Some plans may limit monthly usage, especially satellite and mobile options.
- **Price:** Weigh up installation costs, monthly charges, and any additional fees (like equipment rental).
- **Contract Terms:** Check the length of the contract and whether there are penalties for cancellation.

Consider Support and Reliability

- Choose a provider known for good customer service and responsive technical support.
- Look for options that include hardware warranties and repair turnaround guarantees.
- Find out what happens in an outage—do they provide a fallback option or mobile backup?

Ask the Right Questions

- Can the service be upgraded in future (e.g. to fibre if it becomes available)?
- Will the router and antenna be supplied and installed?
- Is there a trial period or satisfaction guarantee?

Watch out for overly optimistic claims. Rural speeds may be lower than advertised. It's worth requesting a site survey or test before committing. You can also check the Ofcom mobile and broadband checker, explore the Scottish Government's R100 programme, and speak to local authority digital inclusion teams for guidance. Community broadband schemes may also be active in your area and worth exploring.

4.Glossary of Terms

Here are some common terms you might encounter when exploring on-farm connectivity options:

- **FTTP (Fibre to the Premises):** A broadband connection where fibre optic cables run directly to your home or business for maximum speed and reliability.
- **FTTC (Fibre to the Cabinet):** Fibre optic cable runs to a nearby cabinet, with copper wire connecting from the cabinet to your premises.
- **FWA (Fixed Wireless Access):** Broadband delivered via a radio signal from a local mast to an antenna on your property.
- **4G Router:** A router that uses a mobile SIM card to connect to the internet via 4G cellular networks.
- **External Antenna:** A directional antenna mounted outside to improve signal strength for mobile broadband.
- **LEO (Low Earth Orbit) Satellite:** A satellite orbiting closer to Earth than traditional satellites, used by services like Starlink to provide lower latency and higher speed internet.
- **Latency:** The time it takes for data to travel from your device to the server and back. Lower latency is better for video calls and online gaming.
- **Bandwidth:** The maximum amount of data your connection can handle at any one time, usually measured in Mbps (megabits per second).
- **Mbps / Gbps:** Units for measuring data speed. 1 Gbps = 1,000 Mbps.
- **Mesh Wi-Fi:** A system of interconnected devices that distribute Wi-Fi coverage evenly across a large area.
- **IoT (Internet of Things):** Devices like sensors, cameras, or trackers that collect and transmit data via the internet.

5.Extending Connectivity Across the Farm

Getting a strong internet signal to the farmhouse is only the start. Many farms also need connectivity in sheds, workshops, or remote buildings. Here are some ways to extend coverage:

Mesh Wi-Fi Systems
- Use multiple interconnected devices (nodes) placed throughout your property.
- Ideal for large houses or adjoining buildings where one router isn't enough.
- Easy to set up and manage via mobile app.

Point-to-Point Wireless Links
- Use two directional antennas to beam a signal from one location to another (e.g., from house to shed).
- Works well when there's clear line-of-sight and can reach hundreds of metres or more.
- Useful for CCTV, calving shed cameras, or connecting remote offices.

External Access Points
- Mount weatherproof Wi-Fi access points on the outside of buildings.
- Helps extend Wi-Fi to yards, nearby fields, or multiple outbuildings.

Powerline Adapters
- Uses your existing electrical wiring to send internet signals between rooms.
- Less suitable for outbuildings on separate circuits but can help in older stone houses.

Investing in good network planning now means your whole farm can benefit from smart tech, remote monitoring, and reliable communication.

6.Connectivity Comparison Table

Technology	Typical Speeds	Installation	Reliability	Cost	Best For
FTTP	Up to 1 Gbps	Professional	Excellent – unaffected by weather	High up-front; falling with subsidies	High-demand use, cloud services, future-proofi ng
FTTC	30–70 Mbps	Uses phone lines	Good – degrades with distance	Low	Light-to-moderate use near a cabinet
Fixed Wireless Access	30–100 Mbps	Line-of-sight antenna	Varies – weather/obs truction dependent	Moderate	Remote farms near a mast
4G Router	10–100 Mbps	DIY with optional antenna	Good – depends on signal	Affordable	Farms in mobile signal areas needing flexible setup
Starlink	50–250 Mbps	DIY dish with sky view	Very good – global coverage	Higher monthly + equipment	Isolated farms with no reliable land-based connectivity
Community Broadband	30 Mbps to 1 Gbps	Varies by scheme	Depends on setup	Usually low ongoing	Rural communities working together to fill coverage gaps

7.Frequently Asked Questions

What's the best option if I live in a remote area with no existing infrastructure?
Starlink or Fixed Wireless Access (FWA) are often the most viable choices. Starlink offers fast speeds with no dependence on local masts or cables.

Can I use a regular mobile phone plan SIM in a 4G router?
Yes, many mobile SIMs work in routers, but make sure your plan allows for tethering and has sufficient data allowance.

What's the difference between FTTP and FTTC?
FTTP brings fibre-optic cable directly to your building, giving higher speeds. FTTC stops at a cabinet nearby and uses copper cable the rest of the way, which can reduce performance.

Is there funding available to help with installation costs?
Yes – check the Scottish Government's R100 programme, local council initiatives, or the UK Gigabit Broadband Voucher Scheme.

Will I need planning permission to install antennas or dishes?
Usually not, but check with your local planning authority if you're in a listed building, conservation area, or National Park.

How can I check if my 4G signal is strong enough?
Use a mobile phone to test signal outside and near where the router will be. You can also order trial SIMs or use an app like CellMapper or OpenSignal.

Can I extend internet to my calving shed or lambing pen?
Yes – you can use point-to-point antennas or mesh Wi-Fi systems. External access points are useful for open areas.

8.Final Tips

- **Test before you invest.** Trial SIMs and demo kits are worth it.
- **Plan for scale.** Don't just connect today's needs. Think 5 years ahead.
- **Keep it resilient.** Backup power, good hardware, and failover options can save downtime.

With the right broadband setup, your farm can be smarter, more efficient, and future-ready.