inmarsat
The mobile satellite company

ENABLING connected agriculture

Enabling the connected world

Why Inmarsat?

- **Global**
  Seamless global satellite network and support
- **Reliable**
  Unrivalled record operating critical safety networks for over 40 years
- **Secure**
  Trusted by governments to safeguard digital assets
- **Innovation**
  Continued investment to deliver advanced new capabilities
- **Industry expertise**
  Dedicated agriculture team that speaks your language

How we work

Accessing Inmarsat's award-winning connectivity is simple: either we work with you to build a bespoke solution, which we manage on an ongoing basis, or you procure hardware and airtime through our global partner network.

GROWING THE AGRI-TECH REVOLUTION

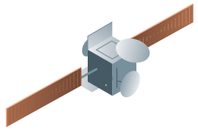
The world's population is expected to reach almost 10 billion by 2050, meaning that we will have over two billion extra mouths to feed. The agriculture industry is under immense pressure to increase its productivity, whilst improving sustainability and environmental protection.

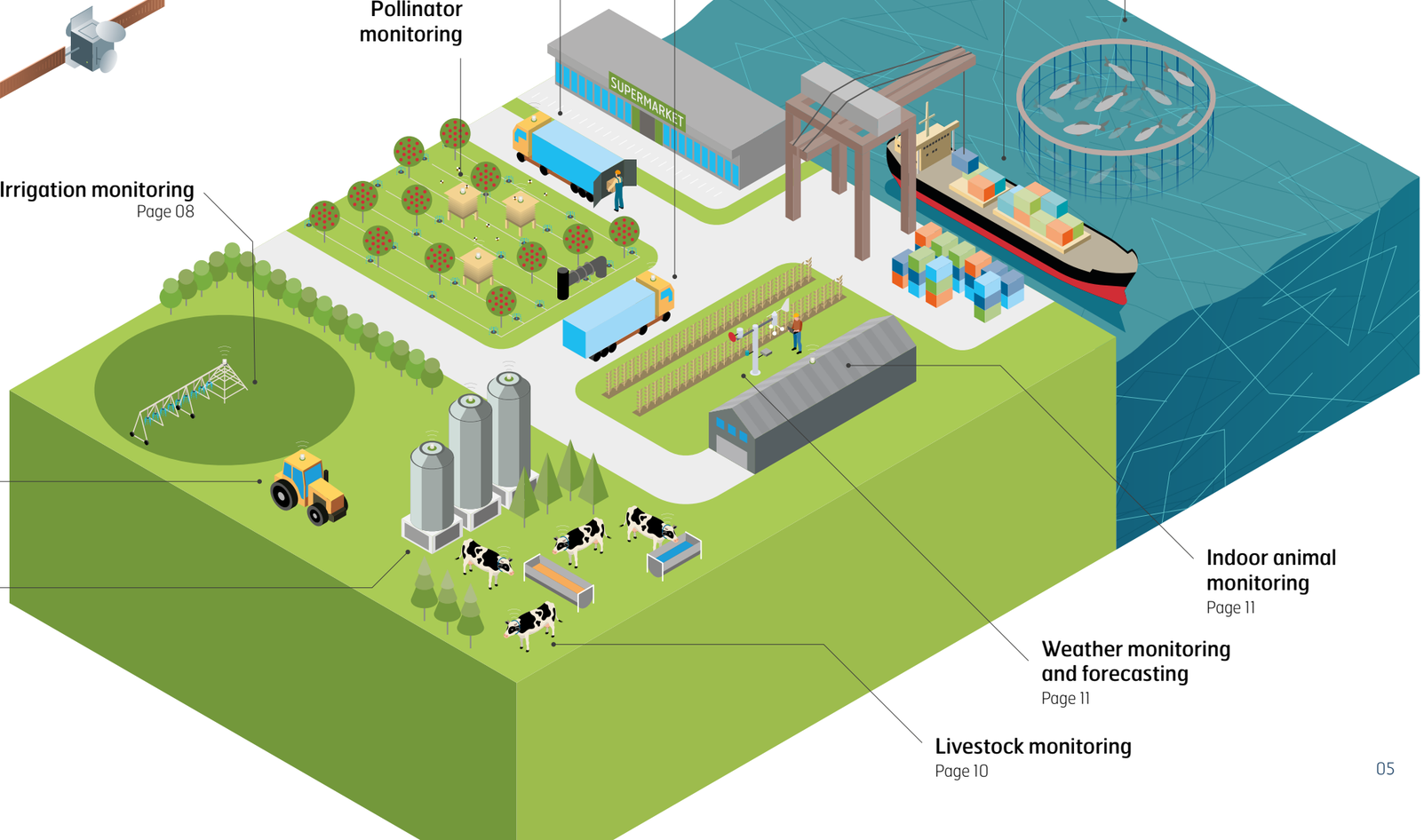
Agricultural technology has a key role to play in providing growers with the data and information needed to produce more with less, whilst increasing transparency across the agri-food supply chain. However; unreliable connectivity will limit its effectiveness.

Inmarsat's global satellite connectivity is at the heart of the agri-tech revolution. Whether you are an agri-tech company looking to expand your market reach to areas of low connectivity, or an agribusiness wanting enhanced visibility of crop conditions, livestock wellbeing or an understanding of your supply chain, Inmarsat's global satellite services and solutions are ready to help transform the outcomes of your projects, wherever you are on the planet.

ENABLING THE CONNECTED FARM AND SUPPLY CHAIN

Inmarsat is the world leader in global mobile satellite communications, and has been equipping industries with the connectivity needed to turn their biggest challenges into opportunities for 40 years. We help producers and manufacturers to connect their operations, delivering IoT technologies and harnessing useful data to drive enhanced performance. Whether you want to improve operational efficiency in the field or through the global multi-modal supply chain, our global connectivity has you covered.





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AGRICULTURAL TECHNOLOGY COMPANIES

Agriculture is changing: digitalisation and emerging technologies are beginning to enable food producers to improve productivity, efficiency and sustainability.

This represents a huge opportunity for technology providers, although connectivity challenges in remote areas are constraining growth potential. With many agricultural technologies at the early adoption stage with farmers and growers, it is crucial that technology providers address connectivity head-on so that it does not prevent market-access as innovations are scaled up.

Inmarsat is helping agricultural technology companies to gain access to new markets in remote areas, where terrestrial connectivity is unreliable. We work collaboratively with our partners to identify the right connectivity and hardware solutions to suit the needs of your customers, and use the latest technologies to optimise their innovations to communicate over our network. Satellite is a cost-effective and flexible communications technology for agricultural use, with highly portable hardware and highly compatible with other connectivity types such as cellular.

Our services

We offer a range of reliable, global and mobile satellite connectivity services, which we can tailor and combine to suit your customers' connectivity needs.

- Broadband Global Area Network (BGAN)
- Broadband Global Area Network M2M (BGAN M2M)
- Land Xpress (LX)
- IsatData Pro (IDP)
- LoRaWAN
- IsatPhone 2

Our connectivity services offer two-way messaging making them particularly suitable for supporting applications that need remote control capability or where updates must be installed remotely.

Where deployment areas suffer from no access to power we can provide integrated connectivity solutions that are self-powered (through solar or wind), and include gateways for local networks (e.g. LoRaWAN, private LTE or mesh networks) that can be managed remotely.

Depending on your technology's capabilities, we also offer leases of satellite capacity for your equipment to communicate directly with our constellation. We take a collaborative approach, working with you to design the best connectivity solution for your technology and market needs.

Irrigation monitoring

Applying the correct amount of water according to the individual needs of crops is vital to maximising yield and quality. In the face of increasing pressure on surface and groundwater abstraction as well as increasing episodes of extreme weather events such as droughts, it is essential that growers are able to accurately apply limited water resources when the crop needs it most. All this requires accurate field level data, which traditionally has involved regular field visits during the season. However, when farming crops over large land areas this can soon become a costly approach, and often doesn't provide the ability to respond quickly to changing environmental and crop conditions.

Our solution offers remote management of fields used for irrigation, including remote acquisition of data on soil moisture, weather and control of your irrigation system. This means you can maximise your yield and quality, whilst reducing physical visits to the field, nutrient losses, pollution and making it easier to comply with tightening regulation.

Machinery and vehicle monitoring

During critical operations such as planting and harvest, any disruption caused by machinery breakdowns or a lack of co-ordination between teams ultimately leads to lost time and money. If you are operating downstream processing facilities such as sugar cane mills a reliable and consistent supply of raw material from field to factory is key to achieving maximum efficiency.

Most modern machines, such as harvesters and logistics trucks produce telemetry data that provides information to track maintenance needs and location, which in turn can help you manage front teams and prevent machinery breakdowns.

However, plantations are often located in areas of unreliable or non-existent cellular coverage, which means that transferring this data and information in real-time is challenging. Inmarsat uses our highly reliable L-band Broadband Global Area Network (BGAN) satellite connectivity to aggregate data from machines in the field, and transfer it in real-time to your operations centre or HQ. This allows you to predict maintenance needs, prevent breakdowns before they happen and respond quickly to incidents in order to maintain throughput and operational efficiency.

Fire monitoring

Fires can begin and take hold rapidly, endangering crops, livestock and infrastructure, as well as risking the health and safety of staff and surrounding communities. Without a way of remotely monitoring and achieving total visibility, a great deal of damage can be done before you are able to react.

Inmarsat's Fire Monitoring Solution incorporates our BGAN connectivity service to provide globally reliable coverage, providing you with real-time alerts in the event of the outbreak of fire, anywhere on your estate.

Crop storage and logistics monitoring

Maintaining optimum conditions for crops, either in storage on-farm or during transit through the multi-modal supply chain, is vital in preventing post-harvest losses. Critical variables such as temperature and humidity can change quickly, affecting crop quality. However, most agribusinesses lack real-time visibility of these conditions, and are thus unable to react quickly to optimise productivity.

Inmarsat's Crop Storage and Logistics Solution allows growers and extended supply chain to remotely monitor crops in store, on land, sea and air. Enabled by our highly reliable, global BGAN satellite connectivity, we can give you visibility of your crops wherever they are. This allows you to optimise supply chain logistics and storage management to improve crop quality, ultimately leading to higher profitability.

CROPPING

A wealth of digital technologies are fast being adopted by growers, which provide the ability to monitor fields remotely and improve productivity with objective data and information.

However, to take advantage of this digital revolution, agribusinesses must have access to reliable internet connectivity to get the data from field to platform. With the right approach to connectivity, data can be aggregated into platforms and shared with the people who need it most, wherever they are.

Inmarsat enables connectivity for agribusinesses globally using our highly reliable L-band services. From here we can build out end-to-end solutions or use our connectivity as an enabler for systems you already use.

LIVESTOCK AND AQUACULTURE

Livestock farmers operating over large ranches and estates are challenged every day to maximise productivity, increase health and welfare and react quickly to adverse incidents to prevent losses.

There are many new technologies coming to market which allow real-time monitoring of animals and assets in the field. All these technologies depend on real-time communications to get the data from field to platform, however, many areas where livestock are farmed are by their nature, remote and lacking in cellular connectivity.

Inmarsat helps you adopt the latest technology on your ranch or farm with the most cost-effective connectivity services and solutions. We can work with you to design a bespoke solution or augment your current solution with the reliable connectivity you need to gain transparency and control.

Livestock monitoring

In large farms and ranches your herds often graze over huge land areas. With limited human resource, monitoring soon becomes a costly and inefficient exercise.

When you do need to drive out to monitor herds, our mobile connectivity services enable you to access your applications and stay in touch on the go.

Inmarsat supports the remote monitoring of cattle through sensor technology enabled by our L-band, Broadband Global Area Network (BGAN) satellite service, which offers highly reliable connectivity in remote areas. Using this capability, farmers can monitor the whereabouts and health of their herds, allowing them to pinpoint and respond to potential risks quickly, resulting in enhanced yields and security.

Remote water monitoring and control

Access to water for livestock is crucial, and farmers on large ranches typically spend a lot of time and money manually checking tanks, dams, troughs and other systems frequently. Using our highly reliable satellite network, Inmarsat enables farmers to remotely monitor their systems wherever they are located, including water levels, system faults and usage trends. This enables huge efficiencies through less manual monitoring, peace of mind and better health and welfare for animals. Additionally, our services allow farmers to remotely control pumps, gates and other infrastructure allowing quicker responses to issues and less field visits.

Indoor animal monitoring

Maintaining optimum conditions in intensive farming systems for pigs, poultry and other species is vital to maximize growth, health and welfare. Monitoring and controlling key variables such as such as water levels, temperature, humidity, ammonia and CO2 in real-time allows you to gain full control. However, many farms are located in areas without terrestrial connectivity, which is a barrier to real-time monitoring.

Inmarsat utilises our highly reliable satellite connectivity to enable real-time monitoring and visibility of conditions. With our partners, we design dashboards and instrument solutions that share data with all the key stakeholders and set up alerts that notify you if a critical event occurs.

Aquaculture

Sea and freshwater farmers are constantly looking for innovative ways to accelerate growth of their stocks and improve efficiency. Maintaining optimum conditions is crucial, and this requires constant monitoring. However, many aquaculture farms are located in remote areas with low connectivity. Using our global satellite network, Inmarsat is enabling the industry to remotely monitor and control their installations, reducing costs and increasing yield.

Inmarsat's aquaculture management solution enables farmers to remotely monitor and control conditions at their farms to produce optimum yields. Our solutions are built to your requirements and include real-time monitoring of dissolved oxygen, pH, ammonia, temperature and salinity. Systems such as automatic feeders can be operated remotely via our global satellite connectivity, enabling you to have control without visiting the site. When a site visit is required, workers are connected to the operations centre at all times by our reliable data and voice communication capabilities.

Fleet monitoring

Agribusinesses face the challenge of operating large, diverse fleets of vehicles that are difficult to manage. These challenges are compounded by the fact that they often operate across remote regions where connectivity is fragmented or non-existent.

Inmarsat offers a range of services, including IsatData Pro and BGAN M2M, to track vehicles in areas of low cellular coverage via our global network. We can build our connectivity into your systems or create a customised solution from scratch. We deliver key data such as location, vehicle weight, and conditions in transit such as temperature and humidity, speed and braking force, providing granular insights into an integral layer of the supply chain.

Supply chain traceability

Implementing agricultural traceability will be key to the successful agribusinesses of the future. Consumers are increasingly demanding transparency over where their food has come from. Traceability also allows the rapid identification of the origin of food safety and other incidents, meaning quicker, more precise recalls and response should an issue be identified.

Inmarsat builds and manages custom solutions that enable manufacturers and producers alike to achieve total visibility of their assets, allowing interventions to be made to improve outcomes. Inmarsat's ubiquitous L-band satellite connectivity and our presence on land, in the air and at sea positions us uniquely to help solve these problems and serve the global supply chain.

Cold chain monitoring

Keeping a temperature sensitive consignment within the optimal range throughout its entire journey is a huge challenge. Every year the industry loses billions to post-harvest loss as a result of sub-optimal conditions in transit.

Inmarsat enables you to monitor the conditions of your temperature sensitive consignments with L-band satellite connectivity, operating with up to 99.9% uptime. We work with you to use the latest sensor technology to monitor critical conditions in transit, including temperature, humidity and if required, other key variables such as Volatile Organic Compounds. With our solutions we deliver maximum transparency so you receive real-time alerts when conditions fluctuate, and allow you to control them via a real-time dashboard.

AGRI-FOOD SUPPLY CHAIN

The agricultural supply chain is vast and complex, making it difficult for farmers, agribusinesses and manufacturers to maintain visibility of critical dependencies at each stage in the process.

A lack of visibility and control can lead to huge post-harvest losses, while the inability to make accurate sustainability and provenance claims on products or to react to rapidly changing demand from customers or food safety incidents, can result in significant problems.

Inmarsat is in a unique position to provide this visibility, using our highly reliable satellite network and existing capability that connects the world's ocean going vessels, aircraft and land based transportation. These services ensure that your assets are generating data wherever they are in the supply chain, so you can benefit from increased visibility and faster decision-making.

OUR CONNECTIVITY SERVICES

Inmarsat provides the widest range of connectivity services and solutions to the agriculture sector.

Land Xpress

BGAN

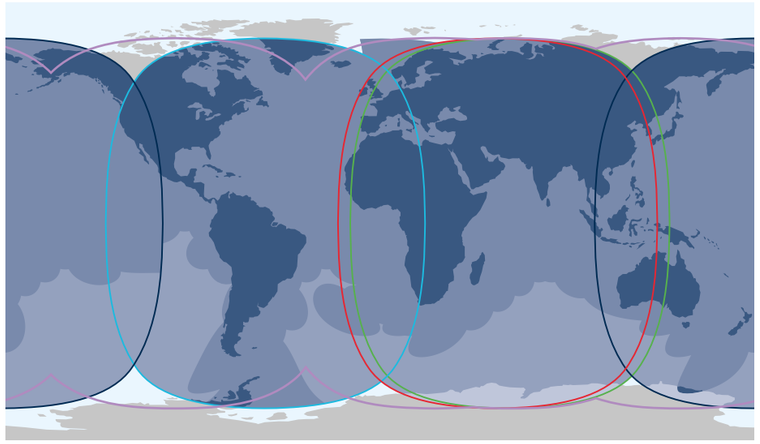
BGAN M2M

IsatData Pro

IsatPhone 2

Land Xpress	BGAN	BGAN M2M	IsatData Pro	IsatPhone 2
Ka-band	L-band	L-band	L-band	L-band
Up to 16 Mbps receive, 4 Mbps send	492kbps	Up to 448 / 464kbps (send / receive)	6,400 / 10,000 bytes (send / receive)	2.4kbps voice codec
VoIP, video conferencing, VPN access, email live video and audio streaming, high-speed broadband for internet access, high-speed file transfer, video surveillance	Email, internet access, Cideo conferencing, video transfer, voice, file transfer, IP SCADA, data backhaul, telemetry.	IP and non- IP SCADA, secure ATM/POS solutions, automation, remote fixed asset monitoring, including telemetry and surveillance, IoT	Asset tracking, fleet management, industrial automation, remote monitoring and control, workflow automation, in-cab dispatch and messaging, IoT	Voice, SMS, short-messasge email, tracking and emergency assistance

Inmarsat I-4 and I-5 network coverage



I-5 F2 I-5 F1 I-5 F3 I-5 F4 I-4 and Alphasat coverage

Global Xpress network available over at least 99% of this area

Extendable Global Xpress coverage via steerable beams

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About Inmarsat

Inmarsat is the leading provider of global mobile satellite communications services. Since 1979, Inmarsat has been providing reliable voice and high-speed data communications to governments, enterprises and other organisations, with a range of services that can be used on land, at sea or in the air. Inmarsat operates around the world, with a presence in the major ports and centres of commerce on every continent. Inmarsat is listed on the London Stock Exchange (ISAT.L). For more information, please visit www.inmarsat.com

About Inmarsat Enterprise

Inmarsat Enterprise is enabling safer, more efficient, more sustainable operations wherever businesses operate on land. Our customers trust us to deliver the industry standard in reliable mobile satellite connectivity, underpinning mission critical communications, remote operations, machine-to-machine (M2M) applications and the Industrial Internet of Things (IoT). With expertise in agriculture, aid and NGO, media, mining, oil and gas, renewables, transport and utilities we work with our partners to build solutions that deliver transformational outcomes and ensure the right level of ongoing management.

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