

# EN<sup>A</sup>BLING

connected mining



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 mining team and decades of experience supporting miners

## 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.

# CONNECTING THE DIGITAL MINE

With a growing world population and emergent consumer demand driving a mining boom, miners are embracing digital technologies to help them get ahead. However, reliable connectivity is key to unlocking the potential of these technologies and most mining operations take place in areas where this is a challenge.

Inmarsat is working with mining organisations across the globe to enable smarter mining practices with satellite connectivity. Our services and solutions are helping majors, mid-tier and juniors to increase efficiencies, increase revenues, decrease operational costs, make the most of their big data, improve health and safety and reduce their environmental impact.

With our global coverage, military-level reliability and industry expertise, only Inmarsat is able to deliver the satellite connectivity services and solutions to transform your operations at all stages of the mining lifecycle, from exploration to production, to mill and on to distribution.





# ENABLING CONNECTED MINING

Inmarsat simplifies the management of your connectivity needs, providing you with a unified experience across your mine portfolio supporting consistently efficient operations and data gathering.

At mine level, we work with you and our partners to provide all the necessary connectivity to ensure your machines, instruments, sensors and people are connected and producing the data that supports intelligent decision making.

We offer your business total flexibility: we can provide connectivity for the entire mine or you can pick and choose individual solutions as your needs change over time. For peace of mind, Inmarsat's L-band network can function as a dedicated, highly reliable backup service, so in the event of a failure, you can count on us to keep your operations going.



# SAFETY AND SUSTAINABILITY

Mining operations have long been focused on Zero Harm for workers and the surrounding environment. The industry recognises the role technology will play in achieving its safety goals, but this technology is only as strong as the connectivity that underpins it, with connectivity outages resulting in severe consequences.

Inmarsat’s heritage is in safety services – we were founded by the International Maritime Organization and the United Nations to deliver safety at sea – and we bring this expertise to the mining sector, delivering ultra-reliable connectivity and solutions with safety in mind. With our help, mining organisations can better manage on site safety, develop their environmental governance and enhance their social licence to operate.



## Remote worker monitoring and communications

Workers often have to operate in remote locations and in difficult conditions, making it essential they are visible and can communicate with control centres and other colleagues at all times. Unreliable communications makes normal operations much harder, but can also put people’s safety at risk. In times of emergency being able to communicate effectively and to understand a worker’s co-ordinates may make all the difference.

Inmarsat offers a range of services that keep workforces connected at all times. Vehicular tracking, enabled by BGAN and IsatData Pro (IDP), allows control centres to understand the exact movements of their fleet, while push-to-talk (PTT) functionality ensures teams are able to communicate wherever they are. Inmarsat’s rugged IsatPhone2 can be trusted to keep people in touch with colleagues and loved ones wherever they are and also features GPS tracking functionality. All of these services are enabled through Inmarsat’s L-band constellation, providing rock-solid reliability.

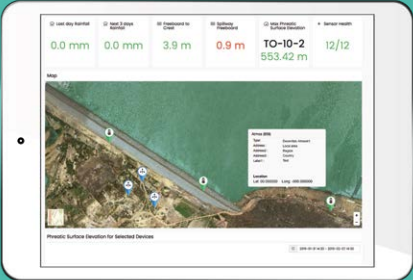
## Tailings dam monitoring

Recent dam failures have moved tailings management to the top of mining organisations’ agendas. Today, thousands of tailings facilities across the globe are monitored inconsistently or not at all, posing a significant risk to human life and health, the environment, brand reputation and social licence to operate, as well as potentially reducing access to capital from bodies demanding compliance with ethical standards.

Inmarsat’s Tailings Dam Monitoring Solution is an end-to-end data collection, storage and monitoring system enabling consistent governance across your global tailings portfolio. It delivers a new depth of insight into the conditions and management of your tailings dams, presenting data from key metrics at site level in real-time on a cloud-based application.

### How it works

Instruments, such as piezometers and ultrasonic height sensors, are connected via Long Range Area Network (LoRaWAN) before Inmarsat’s ultra-reliable Broadband Global Area Network (BGAN) service transfers the data to the cloud. The application offers granular insight, as well as auditing, alarm and note based functionality. The solution works with standalone power infrastructure, meaning it will work on any mine site – closed or open – and is supported on an ongoing basis as a managed service by Inmarsat.







### Drilling analytics connectivity

Drilling is a key aspect of the exploration process, but when faced with limited connectivity it can be a challenge to communicate key geological data back to HQ. In some cases, teams resort to sending a member of staff with a hard drive containing data back to base for it to be analysed, resulting in a significant business disadvantage. Delays and barriers to this process prevent informed decisions being made and from strategic moves from being carried out, resulting in failure to achieve optimal revenues.

As well as connecting drills operated in active pits, Inmarsat also connects drills used in the exploration process. Inmarsat's BGAN and LX services enables teams to transmit data to control rooms in real-time, eliminating time wastage and ensuring that decision makers are equipped with the data to make faster, more informed decisions.

### Managed services for resource exploration

Another key challenge in the exploration process comes with teams regularly having to cross borders between countries, forcing mining companies to switch between connectivity suppliers and contracts to keep their lines of communication open. This approach incurs a great deal of wasted time caused by setting up new accounts with new providers, resulting in inefficiencies.

Inmarsat's Resource Exploration Solution has been designed as a managed service to alleviate the complexity associated with licensing and regulatory approvals, while also handling training and installation. Choose from a variety of Inmarsat's connectivity services such as LX, BGAN, IsatPhone2 and we will handle the complexity, ensuring you benefit from the connectivity wherever your operations take you.

# EXPLORATION

Exploration presents an array of organisational challenges, including: navigating remote regions, crossing borders, safety and security, fast sample analysis and maintaining communications with base. All of these challenges are exacerbated without reliable connectivity, which presents a challenge in itself in many places where resource exploration occurs.

Inmarsat helps you remedy these problems by making access to reliable connectivity simple, wherever you might be. Our service portfolio includes Land Xpress (LX), the first high-speed broadband network from a single operator to span the world. Other services ideal for exploration teams include Broadband Global Area Network (BGAN) and IsatPhone 2, allowing teams to remain in constant contact with each other, and the outside world. We also offer managed solutions, simplifying the delivery and support of services and hardware for a monthly fee, so you deal with just one global connectivity provider and are assured of a range of reliable connectivity services wherever you go.





# PRODUCTION



A connected mine is a smarter mine and a smarter mine is more profitable. Whether you need to monitor vehicle telemetry data from trucks on site or understand the performance of your excavators, Inmarsat's connectivity services and bespoke solutions enable you to react quickly to efficiency risks like breakdowns, and keep operations optimised at all times.

Inmarsat offers a comprehensive set of services and solutions to help support your in-life mine operations. Ranging from services like Land Xpress (LX), offering broadband speeds and perfect for data intensive applications, to our ultra-reliable (Broadband Global Area Network) BGAN service which enables IoT and backup, to our small form (IDP) terminal which is perfect for vehicle and asset tracking, we work with you to deliver the right mix to support your needs. Along with edge technologies, cloud dashboards and differing levels of connectivity management we will help you mine more efficiently, more safely and more sustainably.

## Fleet management and vehicle telemetry

Large fleets of vehicles are common across mine sites, often dispersed and difficult for fleet managers to keep track of they can be prone to breakdown, theft and inefficient usage. Efficient fleet management requires reliable connectivity to ensure there is complete transparency, not just for positioning but also key metrics such as speed, braking force and fuel consumption across your fleet.

Inmarsat enables your fleet managers to understand where vehicles are at all times with our IDP and BGAN services. These highly reliable L-band services ensure that you never experience blind spots where your fleet goes out of range of cellular coverage. They can be easily integrated with a variety of dashboards to create a solution displaying location and key vehicular metrics, so you can understand and regulate driver behaviour.

## Enabling automation and remote operation

In areas with little or no cellular connectivity, miners are challenged when it comes to accessing the benefits of automation, relying on either inefficient manual operation of machinery or automation processes that stop and start as connectivity cuts in and out.

Underpinned by Inmarsat's LX and BGAN connectivity, the Autonomous Backhaul Solution allows mining companies to automate assets in areas without terrestrial connectivity, without the need to build mobile or fibre infrastructure. In addition to enhanced safety, the solution can function as a backup in the event of network failure, ensuring business continuity and protecting the progress of your business.

## Business continuity

Many mines suffer from erratic connectivity with outages bringing operations to a grinding halt. Losing connectivity can dramatically impact revenues and lead to safety issues, yet many mining companies do not have adequate provisions in place to ensure business carries on as usual.

Inmarsat provides dedicated, resilient backup connectivity so that if any other connectivity type of provider fails, your operation continues to function as usual. Our L-band service network has availability up to 99.9% and is trusted by governments and militaries, ships and planes to keep going when everything else fails. We can provide backup for fixed assets, mobile assets, single applications or the mine in totality.



# DISTRIBUTION

Reliable connectivity is essential in optimising global supply chains. Your stakeholders need to understand the movements of consignments to ensure efficiencies, so you can minimise the risk of theft and ensure the people transporting it are safe. All too often trains and ships move through areas without reliable connectivity resulting in accidents and inefficient operations, which damage profitability as well as reputation.

Inmarsat is the world's leading mobile satellite communications provider and is the only provider who can track your goods from pit to port, to customer with ease. Our connectivity is found on most large vessels globally and we have extensive experience in providing rail connectivity in remote areas across the world. Miners trust us to deliver solutions addressing their connectivity challenges on site and through their global supply chain, delivering unparalleled transparency, safety and efficiency.



## Rail

Many mines utilise rail to move raw or refined materials around the world. During these journeys, locomotives moving through remote regions have little or no connectivity, meaning the responsibility for the shipment's safe delivery rests solely on an isolated team. Without visibility of other vehicles on the line, or communications with base, it is easy for accidents to occur or for operations to slow to a crawl, decreasing profitability.

Inmarsat offers a range of services and solutions to keep trains connected and operating safely in areas lacking terrestrial connectivity. Our IDP and Broadband Global Area Network (BGAN) L-band services are highly reliable and enable telemetry services, as well as enabling Push-to-Talk (PTT) functionality. BGAN's high level of reliability also makes it perfect for automating and remotely controlling trains, removing the need for human workers.

## Maritime

Much of the global mineral output is transported by sea, either to mills for further processing or direct to end customers for use in manufacturing. Predicting when new consignments of minerals will arrive into port is a challenge for manufacturers and commodities brokers, particularly when large numbers of ships are trying to get into busy ports. The result is too much of a commodity, or too little, interfering with manufacturing processes and causing reputational damage and decreasing profitability.

Inmarsat can help you and your supply chain understand where your shipments are at all times, enabling smarter decision-making and developing more transparency and trust in your supply chain. As the world's largest provider of ship connectivity and safety services, talk to us to understand how we can help you optimise your maritime distribution networks.

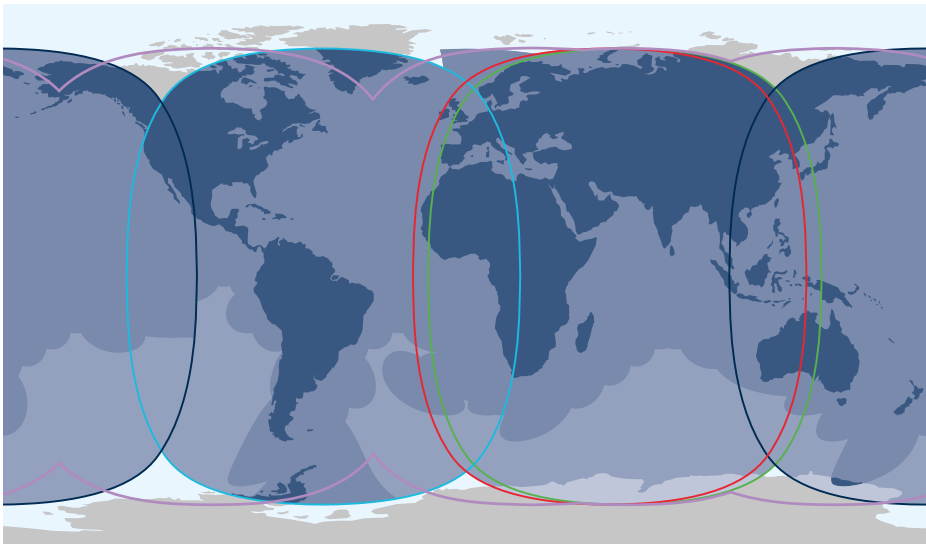


# OUR CONNECTIVITY SERVICES

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

				
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](http://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 (IIoT). 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.



# HOW TO BUY

Inmarsat delivers services and solutions in over 190 countries with our global partners. To learn more please get in touch with our dedicated mining team via our website.

[inmarsat.com/mining](https://inmarsat.com/mining)

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