Integrated Border Management
Mission first. Connectivity always.

Border security is a high priority for every government. Border protection agencies use advanced surveillance, security and control systems as a vital force multiplier in the struggle against terrorism, illegal smuggling, drug trafficking and cross-border crime. Inmarsat’s mobile satellite communications are a flexible, reliable and cost effective component of these systems.

**Future proof your border protection roadmap with Inmarsat**

One of the challenges in developing an integrated border management roadmap is that technology never stands still. Committing to a rigid plan inhibits your ability to exploit new technologies as they arise and renders your plan dated before it even deploys.

With Inmarsat as your partner, however, not only will you have access to the very latest communication technology and networks, but our in-house solutions engineers are constantly horizon-scanning for the latest in applications and systems to ensure that you are kept up-to-date with the latest, most efficient ISR technologies – from collection to analysis to distribution.

The success of an integrated border management system depends on the swift, reliable passage of information between border posts, control headquarters, surveillance assets and mobile patrols.

Inmarsat’s global communications network links static and mobile elements via broadband, regardless of distance, giving them real-time access to live motion video, still imagery and other sensor products, as well as secure command and control communications.
Air Patrols | Sea Patrols | UAVs
---|---|---
SwiftBroadband | FleetBroadband | SwiftBroadband
Blighter with BGAN | Long range Surveillance Radar | Long range Surveillance Radar
SiteGuard | Covert Surveillance Assets | Covert Surveillance Assets
Protected Compound | Command and Control HQ | Deployed Tactical Team
Tri-Star with BGAN | ASIGN Image Management with BGAN | Mobile Data Node 3g Cell with BGAN and Cellcrypt
Integrated border management system

An integrated border management system can usefully be thought of as a series of five layers.

› The base layer is the underlying terrain.
› The second layer is the border, together with the official border crossing points.
› Then there is a third layer of fixed surveillance and protection assets: manned and unmanned, overt and covert observation posts and sensors, command posts and secure compounds.
› Onto this is superimposed the fourth layer: a set of mobile border protection assets: aircraft, unmanned aerial vehicles, mobile patrols and response teams, deployable sensors and foot patrols.
› In order for the system to operate effectively, these layers need to be richly interconnected by robust, high capacity digital communications, which form the vital fifth layer.

The operational architecture of border protection hinges on the border itself, and must traverse whatever terrain or territorial waters the border passes through. In circumstances when the border protection posture is high, the fixed layer of border surveillance and protection assets is deployed in order to provide as complete as possible a picture of the territory beyond the border. Surveillance radars such as BLIGHTER can detect moving targets out to ranges of tens of kilometres across land or water. Once a target is detected, whether by radar, acoustic or seismic sensors, other higher resolution sensors can be brought into play in order to monitor, track and identify it. If sensors are deployed in sufficient numbers, and carefully placed, they can effectively form a virtual fence. Sensors can be located in overt manned observation towers, covert observation posts or unmanned installations (both overt and covert). BGAN systems are available to provide broadband satellite communications for both overt and covert applications, using the Low Profile BGAN terminal when a low profile is required.

Along the border there are likely to be sensitive border protection or security locations which are housed in secure compounds. These too will benefit from the deployment of sensors, such as the Tri-Star video system, for local warning and protection.

The information from the sensors must be brought together for analysis and action, and this will take place in the command and control headquarters that also form a part of the fixed layer. These headquarters must be able to communicate with every sensor, with other headquarters, with the border crossing posts handling travellers and goods, with every mobile asset, and with higher and national headquarters. For short-range communications, WiFi or 3g communications will suffice. These may be supplemented by VHF or UHF net radio, push-to-talk systems, TETRAPOL or TETRA. Beyond line-of-sight communications can be conducted over HF (at low data rates), via repeaters and relays, or using mobile satellite communications such as BGAN. A range of crypto solutions is available to protect the integrity of communications, including the Cellcrypt secure voice-over-IP app.
Command and control headquarters will make use of a range of advanced communications and data processing tools, including databases, intelligence analysis toolkits, geographical information systems, and image handling applications such as ASIGN.

The command and control headquarters is where the decision will be taken to deploy mobile assets, whether in a precautionary mode in order to supplement the fixed virtual fence, or in response to an incident or sighting. Aircraft and unmanned aerial vehicles can communicate over HF, VHF or UHF, or using satellite broadband via a SwiftBroadband installation. Mobile vehicle and foot patrols have the choice of BGAN or the L-TAC system which adapts standard duplex UHF radios so that they can use the Inmarsat I-4 satellite constellation.

When deployable border response teams apprehend a suspect, they can draw on a range of advanced technologies to assist in search, data capture (biometrics and fingerprinting) and documenting their activities and finds. BGAN allows teams to transmit such information to the command and control centre and beyond for deeper analysis and comparison with archived data. It also enables teams to receive live updates and orders for their controllers.

**Case Study: Coast Guard and Border Security**

Australia’s Border Protection Command required a real-time communication link to provide imagery and other data from multiple aircraft every five minutes. The system needed to operate reliably across Australia’s entire exclusive zone and provide a link between the fleet of aircraft patrolling the national borders and headquarters in the nation’s capital.

A multi-channel Inmarsat SwiftBroadband system was installed providing a continuous data connection as well as a video link and normal telephone communications.
**Ground Surveillance Radar**

Ground surveillance radars scan the ground to detect intruders in any weather and in most environments. The Blighter radar system is ideally suited to remote detection over large open areas of land including rocky mountainous terrain, scanning an area of over 3,000 km² in a matter of seconds. It can be used as the primary detection sensor for long-range remote surveillance platforms, generating images which can be transmitted via BGAN for analysis, or to trigger other sensor systems such as full motion video.

**Mobile Data Node**

Access to mobile “apps” and 3G voice and data services in remote, hostile and extreme environments.

In combination, BGAN and the Mobile Data Node provide a portable, easy to use and flexible way to maintain a broadband connection wherever it is needed. The Mobile Data Node’s 3G capability generates a “bubble” of cellular network connectivity 1km in diameter, within which border management and protection personnel can use their mobile devices and smartphones. This powerful communications capability will allow border agencies to exploit the full potential of mobile apps and services beyond the reach of the terrestrial cellular footprint. The Mobile Data Node weighs less than 2 kg and is ruggedized for use in extreme conditions.
ASIGN

A global image communications system for satellite and wireless links.

ASIGN gives remote access to photo and video information, optimizing the transfer of images to provide the highest picture quality sustainable by the communications channel. When combined with BGAN, this gives border agencies the ability to exploit high resolution imagery even in the most remote locations, whether in static or ad-hoc locations or even on-the-move. Full integration with photo triggering sensors allows for true multi-source observation and the deployment of unmanned remote surveillance systems. ASIGN supports direct GPS tagging and integrates with GIS and rapid mapping. ASIGN images can be received, processed and distributed worldwide in less than a minute after capture in a fully controllable and cost effective way. ASIGN is the only image communication system that supports reliable satellite multicast using Inmarsat BGAN.

Cellcrypt

Cellcrypt is a smartphone app which allows users to make secure voice calls. It can be used beyond the terrestrial cellphone network footprint by combining it with a Mobile Data Node, a Wifi enabled BGAN terminal, or a standard BGAN terminal and separate WiFi router. Cellcrypt uses a FIPS 140-2 accredited crypto core to provide government level security. The end-to-end encryption applied by Cellcrypt protects against the risk of call interception over each of the multiple segments of the call path, which includes the wireless network between the phone and the base station or wireless router, fixed lines within and between carrier networks and Internet backhaul. Android™, BlackBerry®, iPhone® and Nokia® phones are supported.

Tri-Star

The Digital Barriers TVI R500 Tri-Star is an integrated, resilient and rapidly deployable remote surveillance solution, combining video and audio streaming with an built-in digital video recorder and an IP hub. Live streaming is triggered by a range of intelligent or simple alarms, with multiple operators able to access the live output simultaneously on fixed and mobile platforms. The R500 features a ruggedised compact enclosure, low power consumption and the flexibility to operate over multiple communications bearers - cellular to satellite and Wi-Fi.

The Tri-Star is designed to work in remote, hostile and mobile scenarios, or as part of a large scale surveillance architecture, and is in use today by governments all over the world.
Inmarsat has access to a number of advanced surveillance technologies that enhance situational awareness and deliver real-time intelligence. The Tri-Star solution from Digital Barriers is one such technology currently in use to support the operations of governments and border agencies, protecting borders and ports of entry all over the world.

UAVs are increasingly being used for intelligence, surveillance and reconnaissance missions and their value in protecting long borders is self-evident. A single UAV can cover more ground more quickly and at less cost than foot or vehicle mounted border patrols. Recent developments in satellite technology have seen Inmarsat’s services being exploited on these very small airframes to an ever-growing extent. We have worked with our partners to develop bespoke satellite-based communications solutions that allow UAVs to be redeployed rapidly, enabling them to cover a broad area of operations.

Border forces are routinely equipped with UHF line of sight radios. Inmarsat’s L-TAC service offers a unique capability to provide single hop L-to-L band relay from the global L-4 constellation of geostationary satellites. Designed with tactical mobile operations in mind, the service enables such radios to access Beyond Line of Sight communications (BLOS) without the need to modify the radio hardware or cryptos, or deploy rebroadcast stations. The service complements existing UHF TACSAT channel availability over a leased L-band channel to provide reliable voice and data connectivity independent of local infrastructure. L-TAC is ideal for border forces operating over long distances.
IsatPhone Pro

The IsatPhone Pro is a low-cost, handheld satellite phone that lets you make calls - anywhere - around the globe. It offers the ultimate combination of features and performance - including exceptional voice clarity, SMS text messaging and email - over the world’s most reliable satellite communications network. It has an exceptional battery life: 8 hours talk time and 100 hours standby. IP54 rated, it is dust, splash and shock resistant and operates over a temperature range from minus 20 degrees Centigrade to 55 degrees Centigrade. With Bluetooth support and a range of docking solutions, it can be used on foot, in vehicles and at sea.

Machine to Machine

Inmarsat’s range of M2M solutions can provide you with a global data service at a fraction of the cost that you would expect from a satellite communications link. Inmarsat M2M services allow you to deploy border protection systems with short implementation lead times and has integrated GPS for mobile asset tracking.

The Inmarsat M2M range allows the remote control, management and tracking of remote assets via SCADA, telemetry and remote monitoring equipment leading to:

➤ An increase in system knowledge and situational awareness
➤ Reduction in repair costs
➤ Reduction in labour costs
➤ Increase in equipment life

No matter how much data you wish to send and receive, and the frequency of your transmissions, we will be able to find an Inmarsat M2M solution that will meet your needs for remote monitoring, management, SCADA, tracking or disaster recovery.

Site Guard

Remote sites, by their very nature, are very hard to monitor for unusual events or site conditions - a log or other debris affecting the measurement conditions, a flash flood sweeping through the site, or vandalism.

With the SITE GUARD™ Camera System, a high definition photograph of the measurement site can be taken daily, hourly or on demand and sent back to the operator to view as required. With a regular photograph – or even video if required - the local conditions around the site can be observed to help assess the readings, site visits to investigate any anomalies can be reduced. By helping you keep an eye on your remote sites, the SITE GUARD™ Camera System will save time and money. Whilst regular data readings are important and site visits are necessary, a picture can paint a thousand words as to the local conditions on your remote sites, saving you time and money.

Central Server

Data and images can be accessed online through the user-friendly SiteGuard web interface – giving you a direct eye on your remote sites.

Remote Site

The Site Guard system is housed in a ruggedized enclosure with an IP 66 rating. This rating will protect personnel from incidental contact with the enclosed equipment and will provide protection from environmental exposure including dust, rain, dirt, sleet, snow, strong jets of water, and the formation of ice on the enclosure.

Can be AC or 12VDC powered and comes complete with tripod and mounting brackets.
Inmarsat: When you need insight, not just airtime

No matter how fast, secure and reliable your communications link, your integrated border management system is dependent on a complete answer — not merely a list of components. Inmarsat works with local partners, end-users and leading technology providers to deliver world-class solutions.
Inmarsat Network

Inmarsat’s capabilities are growing as the demand for data increases and technological innovation offers solutions. Our network programs meet the needs of today while preparing to fulfill the requirements of tomorrow’s government customers.

By enhancing our current services and expanding into the world of Global Xpress we are continuing to grow our network capability in line with your operational requirements. Inmarsat is your network for the future.

**Inmarsat I-4 delivers:**

**Standard IP**
For email, Internet and intranet via secure VPN connection, at speeds of up to 492kbps over a shared channel.

**Streaming IP**
Data rates on demand up to 700kbps. Choose your required data rate on a case-by-case basis, depending on your chosen application. Also supports ISDN at 64kbps.

**Key service features**
- Global coverage
- Broadband data and voice
- Compact lightweight terminals
- Mobile, quick to deploy and easy to use

- Near-instant connectivity
- All-weather capability
- Standard, intuitive interface
- Interoperable and flexible
- Reliable network availability

**Voice**
Make phone calls at the same time as accessing your data applications. Voicemail and other mobile supplementary services are available.

**Text**
Send and receive text messages via your laptop, to or from any mobile phone.

Global interoperability

With a global constellation of satellites, a world-wide terrestrial communications backbone, highly reliable connectivity, seamless mobility and secure communications links, the Inmarsat network allows your integrated border management architecture to operate across your air, sea and land assets, thus helping to maximise your coverage and your cost- and operational-effectiveness.

Text

Send and receive text messages via your laptop, to or from any mobile phone.
Your communications link

Integrated border protection requires coordination across land, sea and air. Communications that enable transparent interoperability have become essential. Inmarsat provides this crucial communications link.

On the ground
Inmarsat’s land-focused service, BGAN, is accessible through a range of compact, highly portable terminals with performance options to support your integrated border management needs, whether in remote or congested locations. Standard terminals are highly portable and robust enough to withstand challenging environments and weather conditions. Specialist low-profile versions have been developed for covert operations and can be manufactured to order.

On the move
Vehicular comms-on-the-move systems comprise an interior rack-mountable terminal and roof-top tracking antenna, delivering real-time, high speed connectivity during rapidly-developing mobile operations.

At sea
Inmarsat’s maritime service, FleetBroadband, is completely interoperable with BGAN. It is available through three types of terminal, differing in size and performance. All terminals are designed specifically for the maritime environment and support a range of off-the-shelf software, as well as specialised user applications.

In the air
Inmarsat’s aviation service, SwiftBroadband, is also completely interoperable with BGAN. SwiftBroadband terminals are mounted inside the aircraft and utilize existing high-gain Aero H+/Swift 64 antennae, if present. Smaller, lighter units are available for UAV applications. We are working on an upgrade to enable under-the-rotor SwiftBroadband operation in helicopters from early 2014.
Inmarsat is extremely proud of more than 30 years of heritage supporting a wide range of government customers throughout the world. We have offices all over the world, each of which works with local partners to provide a hub of support for government clients. Through these partnerships, we can work together to understand your operational requirements and provide solutions that are tailored to your regionally specific communications needs.

**Global reach**

- 30 Gbps terrestrial network capacity
- 600 channel partners
- Over 1,600 employees in 40 countries
- 4 Operating satellites constellations; 5th one due soon
- Secure broadband network access anywhere, anytime

**Inmarsat I-4 Coverage Map**

*The map depicts Inmarsat’s expectations of coverage, but does not represent a guarantee of service. The availability of service at the edge of the coverage areas fluctuated depending on various conditions.*
How to buy

Inmarsat products and services are available through select Inmarsat distribution partners and service providers.

Visit our website to find the right partner for you.

inmarsat.com/search-for-partner

inmarsat.com/government

While the information in this document has been prepared in good faith, no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability (howsoever arising) is or will be accepted by the Inmarsat group or any of its officers, employees or agents in relation to the adequacy, accuracy, completeness, reasonableness or fitness for purpose of the information in this document. All and any such responsibility and liability is expressly disclaimed and excluded to the maximum extent permitted by applicable law. INMARSAT is a trademark owned by the International Mobile Satellite Organisation, the Inmarsat Logo is a trademark owned by Inmarsat (IP) Company Limited. Both trademarks are licensed to Inmarsat Global Limited. All other Inmarsat trade marks in this document are owned by Inmarsat Global Limited. © Inmarsat Global Limited 2015. All rights reserved. Integrated Border Management. July 2015.