Global Xpress

10 things you need to know about GX

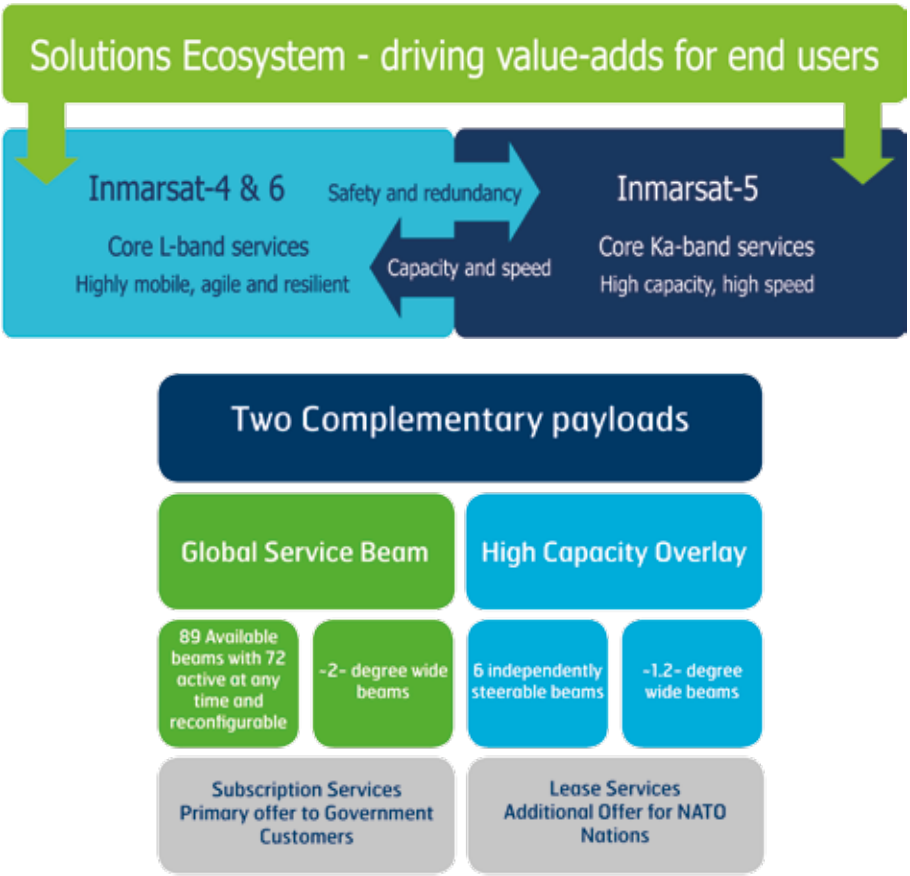
What does GX mean for Governments?

The Global Xpress service complements Inmarsat's existing L-Band network by providing far higher capacity services with the simplicity, global reach and quality standards Inmarsat is renowned for.

By delivering a seamless and complimentary network of L-Band services and GX services for land, air and maritime use, Inmarsat and its extensive partner network can provide unparalleled satellite services. Inmarsat's 14 network connects users from virtually anywhere around the world without any reliance on local terrestrial networks. The addition of the broadband GX services removes the barriers of supporting high data rates, robustly and securely facilitating the exchange of large volumes of traffic for mobile users.

The integrated Inmarsat network can provide a full range of global mobile services ranging from personal satellite phones to extremely high throughput services into stabilised antenna systems in government specific Ka-Frequency band.

This brochure will arm you with the top 10 things you will need to know in order to successfully position core Global Xpress services for government requirements.



Two complementary payloads

Global Xpress offers two quite different service propositions. The services are enabled by two complementary payloads on-board each of the GX satellites in the constellation:

Global Service Beams

The GSB and their associated satellite payload underpin the provision of managed services across the patchwork of 89 beams on each satellite. All aspects of acquiring and authenticating on the service are completed via the GX network and terminals. This means users can seamlessly roam or deploy anywhere within their subscribed GX footprint.

Worldwide wideband access

- Up to 72 active beams
- Fully redundant gateways in trusted countries
- Secure facilities in each gateway

Globally transportable mobile capacity

- iDirect-based, seamless beam handover
- Performance and beam optimization
- Consistent coverage

High-Capacity Payload (HCP)

Military Ka-band complements WGS

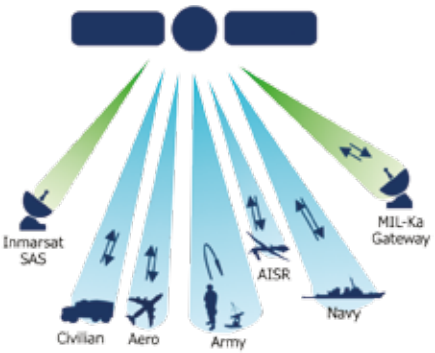
- Interoperable with existing DoD terminals

Commercial and military Ka steerable overlay

- Rapid response to world events
- Securely pointed mil-Ka for OPSEC

Interoperability with GSB

- Higher gain for improved efficiencies
- Transparent handover of services



Security

With 30 years experience in serving government customers, rest assured that data and signalling are encrypted and secure to the highest commercial standards.

The Inmarsat GX network is base-lined to satisfy US Mission Assurance Category (MAC) level 3 and NATO equivillent, with secure gateways and satellite commanding. In addition, a number of measures are built into the network to provide even higher standards of security. Each GX gateway station features a secure enclave designed and operated to support MAC I/II level networks.

National security requirements differ from region to region and are usually tiered across a number of levels of classification. Inmarsat is available to assist in achieving security requirements to support operational needs.

- Fully redundant and secure regional Satellite Access Stations (SAS) strategically positioned in NATO or Five Eyes countries
- Robust network base-lined as Mission Assurance Category (MAC) III
- Global Xpress secure enclave supports enhanced security up to MAC level I and separation from commercial traffic
- Military grade encrypted satellite commanding
- Data and signalling encrypted to the highest standards

Mobility

GX is designed to support mobile terminals with the ability to seamlessly transit between beams or between satellites

How does it do this?

- The global signalling channel makes the frequencies and locations of each beam known to the terminals
- Make-Before-Break beam switching made possible by two receivers in the Core Module
- Identical Ka-band geostationary spot-beam satellites for worldwide coverage
- Seamless beam-to-beam handover
- Complemented by Inmarsat 4s in a hybrid offering, delivering consistent and resilient worldwide coverage and industry highest all-weather availability

IV Interoperability

The only worldwide commercial satellite network interoperable with MILSATCOM Ka-band networks

- The only worldwide commercial satellite network interoperable with MILSATCOM Ka-band networksCompatible with military Ka-band systems
- The only worldwide commercial satellite network interoperable with MILSATCOM Ka-band networksComplements the Wideband Global SATCOM (WGS) network allowing cost-effective augmentation, when needed
- Resilient, worldwide capability, using existing WGS-certified terminals
- Steerable overlay addresses hot spots for rapid response

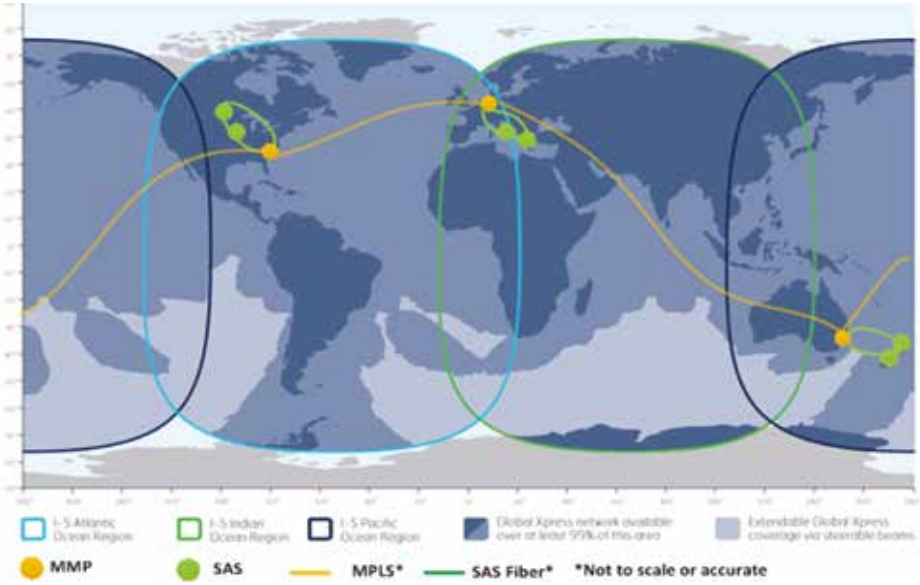
V Go Anywhere

Easily deploy into a high activity location

The GX network has the flexibility to switch power between beams while in orbit to move the distribution of capability should the requirements change over time. This provides Inmarsat with the rare ability to provide almost on-call surge capacity loading into a given location that suddenly requires extensive resources, as would be necessary to support areas of natural disaster, conflict or humanitarian relief.

Easily re-deploying to a different geographical location

As the Inmarsat GX solution is global, the solution that you deploy in one geographical location covered by one GX satellite will work under another GX satellite in a totally different part of the world. No more issues with polarisation, etc which can be a problem with regional Ku services.



Global Xpress coverage

VI Affordability

Providing simplicity and affordability in global wideband services, through one trusted provider.

Cost effective approach to wideband services

Bandwidth provisioned once at global level

- Cost-effective delivery of data
- Lower total cost of ownership than multiple VSAT services

One Contract

- One price
- One contract
- One Service Level Agreement

Access to high-performance Ka-bandwidth through compact and affordable terminals

Re-use of existing WGS-certified terminals to complement government capacity

VII Performance

- Worldwide network delivers consistently high performance
- Able to direct spot beams for additional capacity where needed
- Redundant and diverse ground infrastructure with Multiprotocol Label Switching (MPLS) terrestrial backbone
- Quality of service and performance optimizations support the most demanding mobile applications
- Enhanced operational flexibility as terminals tune through commercial and military bands
- True global roaming


EXPLORER

VIII Simplicity

Single Invoice

Inmarsat's GX network allows single invoicing on your global wideband services. There is no need to negotiate multiple contracts with multiple vendors.

One touch commissioning

Unlike normal VSAT services, the GX network removes the need for a satcom specialist to set up and commission your terminal. All terminals feature one touch commissioning that automates the process of setting the terminal up. The network links the terminal's unique ID with the services defined for the terminal and sets up all the parameters automatically. There are even terminals within the portfolio that feature auto-point, removing the need for users to do any more than simply assemble the terminal and roughly position so it can acquire the satellite.

INMARSAT gateway

Service enablement tool

This central service enablement tool will allow partners to connect via portals or API. GX Core system functionality will include:

- Billing
- Provisioning
- Network Operations
- Service Settings and Configuration
- Customer Service (Ticketing)
- Monitoring and service assurance

IX What about the rain?

All VSAT networks are impacted by rain-fade. So how does GX perform?

Adaptive ModCod

The GX system adjusts the modulation and coding scheme to use additional satellite power if available or reduce data-rate to over come rain-fade.

Gateways

Each satellite has 2 gateway stations (SAS) in different regions. System does auto handover between gateways to remove impact of rain fade on feeder links

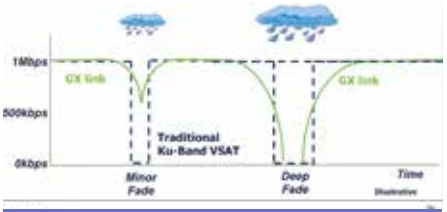
L-Band Backup

The NSD (Network Service Device) provides auto fail-over between GX services and BGAN L-Band services

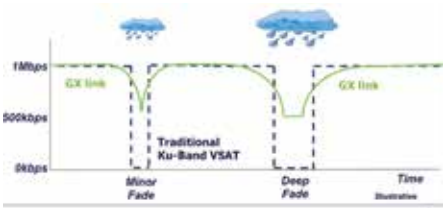
GX is more robust against rain fade than other typical VSAT networks.

Illustrative impact of rain-fade on satcom link

Adaptive Coding and Modulation (fwd link) and A-TDMA (rtn link) used in GX network enables the system to assign more power or to gracefully slow throughput to avoid link loss



Deep fades can nevertheless cause GX network to lose lock

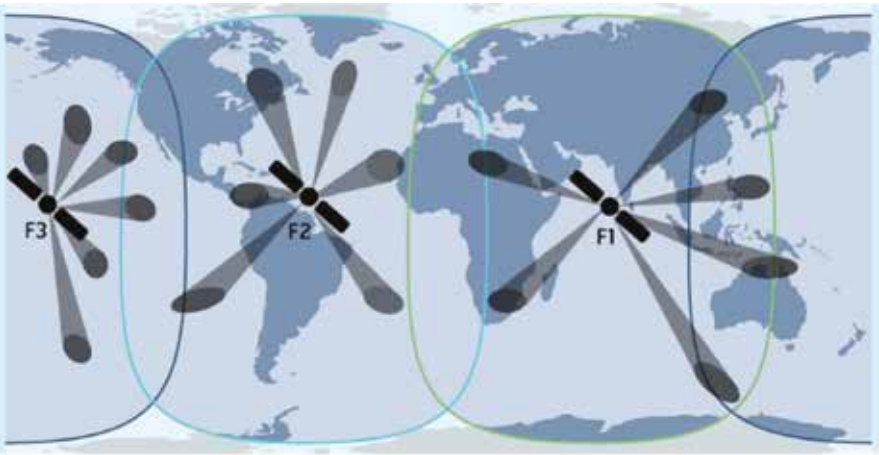


Use of the NSD and L-Band back-up can avoid complete loss of link

Global Xpress System Overview

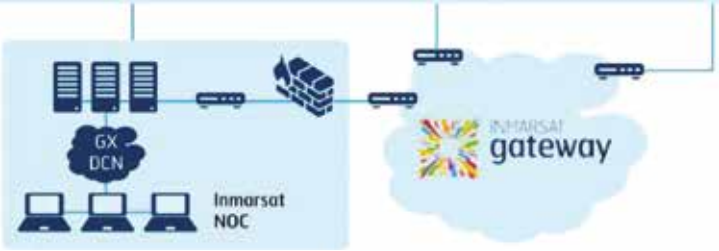
Global Xpress, Inmarsat S (I-S)

- 3 Geo Ka-band satellites (AOR, IOR, POR)
- Worldwide coverage
- 6 steerable high capacity spotbeams per I-S
- Fully operational in 2015
- Fourth I-S is on order



Satellite Access Stations (SAS)

- 6 SAS sites supporting global coverage and site diversity
- DVB-S2/TDMA infrastructure
- Secure enclave for increased security
- AES-256 Encryption



GX User Terminals

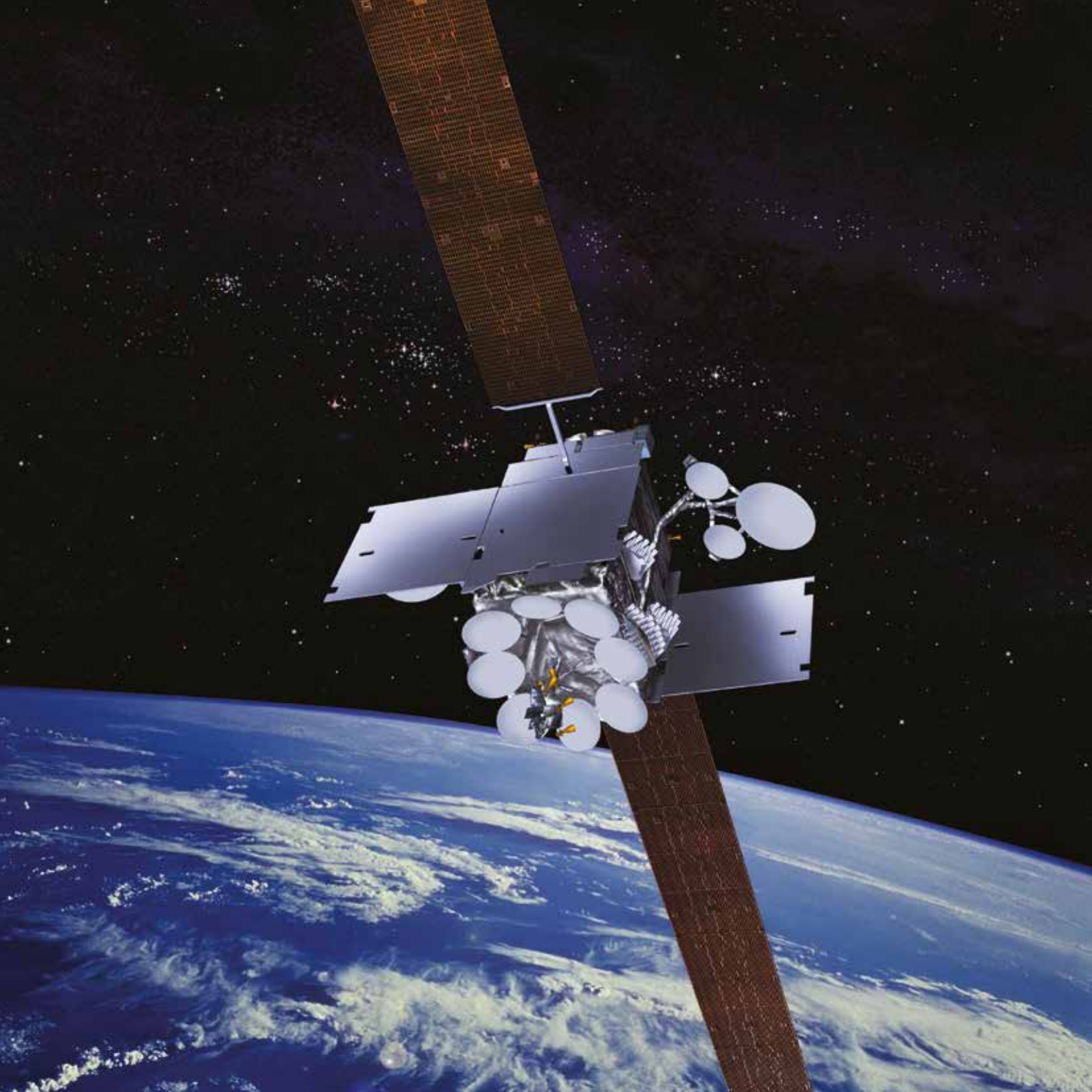
- Terminal sizes from 30 cm to 2.4 m
- Variants for land, air and sea
- Top-tier terminal vendors
- Common Core Module

Maritime

Communications on the Move (COTM)

Forward Operating Base (FOB)

Airborne



How to buy

Inmarsat have a range of partners to buy from, to find one that suits your needs go to **inmarsat.com/partners** or call sales on **+44 (0)20 7728 0000**.

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