Viasat

G-MODMAN Smart Ecosystem

G-MODMAN II, G-MODMAN OP, G-MODMAN II LITE, G-MODMAN Land

Suite of innovative technologies enabling seamless implementation of Global Xpress terminals on U.S. Government aviation and land platforms

G-MODMAN SMART ECOSYSTEM

Developed on the proven government modem manager technology and with specific communications-on-the-move (COTM) requirements in mind, G-MODMAN is a smart ecosystem of products built around the Global Xpress Ka-band service. It enables the next generation of high-throughput worldwide satellite communications (SATCOM) services for airborne and land expeditionary government users.

The G-MODMAN family of products includes G-MODMAN II, G-MODMAN Open Platform (OP), G-MODMAN II LITE, G-MODMAN LAND. These lightweight, flexible and easy to use solutions seamlessly integrate with exiting antenna systems and provide the enabling technology to support implementation of current and future generations of Global Xpress services and user terminals.

Near Real-time Monitoring

The G-MODMAN smart ecosystem builds upon our already robust monitoring system and includes high-fidelity monitoring and logging features on Global Xpress. It includes debugging and alarming of terminals remotely and in near real-time. This system saves users a significant amount of resources otherwise spent on troubleshooting and analyzing information “after the fact”, bringing users back into operation in a fraction of the time. This monitoring data is stored and can be accessed at later points for up to one year to evaluate past performance and trend analysis.

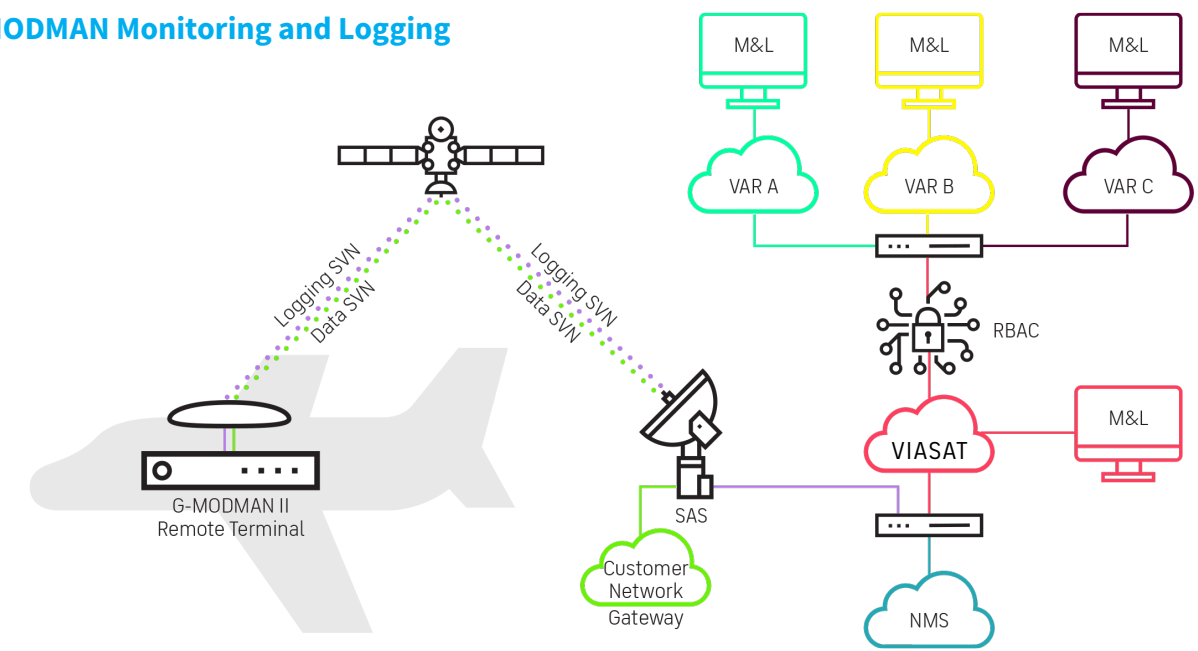
Backwards Compatibility

G-MODMAN variants are compliant with the existing GX1-GX6 satellites and ground network, as well as the next generation of Global Xpress satellites.

Warranty

G-MODMAN variants come with a standard one-year warranty, with the ability to purchase up to five years of extended warranty.

G-MODMAN Monitoring and Logging



SECURE, OPEN ARCHITECTURE SYSTEM

Our G-MODMAN variants support open standards, such as OpenAMIP and OpenBMIP protocols, to provide the flexibility to adapt to various antenna systems. OpenAMIP allows for communications between the G-MODMAN and the Antenna Controller Unit (ACU). By using this common protocol, G-MODMAN can support a multitude of terminals from any manufacturer. OpenBMIP is the underlying protocol for One Touch Commissioning (OTC), where the user only needs to calibrate the antenna once after installation. After this, the terminal connect to the Global Xpress network worldwide without having to commission or call up the Network Operations Center (NOC).

Furthermore, our various G-MODMAN products offer the following secure, open architecture features:

- The G-MODMAN II, G-MODMAN II LITE and G-MODMAN LAND manage user traffic, management data, aircraft data and antenna control information.
- To deliver precise pointing accuracy, G-MODMAN II and G-MODMAN LITE have a built-in Received Signal Strength Indicator (RSSI) that provides carrier strength feedback to assist with antenna tracking. The RSSI is able to leverage the Global Xpress global signaling channels (available everywhere) or the stronger Digital Video Broadcasting - Satellite - Second Generation (DVB-S2) carriers.
- The G-MODMAN II and G-MODMAN OP have two form factors that meet the Modified Airworthiness Certification Criteria (MACC) safe-to-fly requirements or the stringent set of DO-160G and MIL-STD-810G requirements.
- The G-MODMAN II LITE has a unique form factor that meets MIL-STD-810G requirements to ensure successful operations on small UAVs while the G-MODMAN LAND's unique form factor meets MIL-STD-810H requirements to ensure successful operations in Communications-on-the-Pause (COTP) and COTM environments.

SUPPORT PORTAL AND HELP DESK

As part of the G-MODMAN solution set, we provide a support structure to enable fast integration, easy configuration and rapid issue resolution. The Support Portal and Help Desk provide system integrators and developers with dedicated, customized support via a combination of web portal and U.S.-based help desk services to assist with G-MODMAN integration and 24/7 operations support.

Support Portal features:

- Configurator that automates the G-MODMAN variants setup
- Web User Interface (UI) that allows an easy access to the latest G-MODMAN software bundle
- Full terminal document library
- Role Based Access Control (RBAC) ensures integrators have access to the appropriate documents and configurator

Help Desk features:

- U.S.-based reliable support for G-MODMAN variants integration and 24/7 operations support via the Support Portal and Help Desk
- Single phone number/email for all software and hardware support requests
- Tracking of all phone calls, messages and issues to ensure rapid resolution

INTRODUCING THE G-MODMAN VARIANTS

G-MODMAN II

Built to the global, mobile requirements of government airborne platforms, G-MODMAN II is a flexible and easy-to-use solution that seamlessly integrates with existing antenna control systems and provides the enabling technology to support the implementation of the next generation of Global Xpress aero terminals across multiple aviation platforms, including a very low size, weight and power (SWaP) terminal solutions for Uncrewed Aircraft Systems (UAS).

G-MODMAN II is available in two form factors – 1 Rack Unit (RU) and ARINC 404A ½ Air Transport Rack (ATR) to support U.S. Government aviation missions – both crewed and uncrewed aerial operations.

G-MODMAN II RU

(1 Rack Unit Form Factor)

G-MODMAN II RU is a 1 Rack Unit (RU) form-factor offering, combining the iDirect IQ800 modem with hardware capable of utilizing the next-generation of Global Xpress satellites. The G-MODMAN II RU solution meets Modified Airworthiness Certification Criteria (MACC) safe-to-fly requirements, as well as a stringent set of MIL-STD-810G requirements (details available upon request).

G-MODMAN II 1/2 ATR

ARINC-404A Form Factor

G-MODMAN Air Transport Rack (ATR) form factor offering, engineered to cope with harsh environmental conditions, such as searing heat or icy blasts experienced in unpressurized environments. It is designed for the U.S. Government UAS market based on MIL-STD-810G and DO-160G environmental requirements (details available upon request).

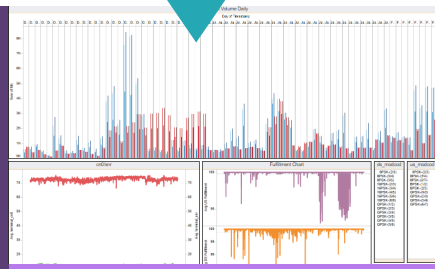
Antenna

Ball Ka 1204A | Orbit GX30 | Orbit GX46 | Get SAT MilliSAT H LW | Get SAT MilliSAT W LW | Get SAT MilliSAT EX | ThinKom ThinAir GT 2517

G-MODMAN II RU/ATR

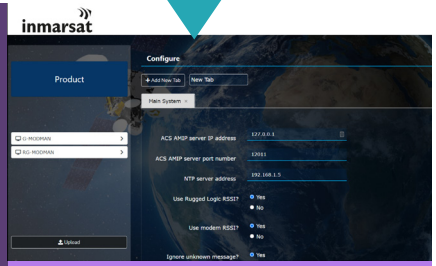
- Onboard application computer for live monitoring and visualization
- Integrated Black ICE SDR (Planned Product Enhancement)
- Supports next-gen terminals and R2 satellite high throughput networks

Monitoring and Logging



- Storage and display of previous flight performance parameters
- Enhanced remote debugging in near-real time

Support Portal



- Download configuration files
- VAM integration assistance (help desk)
- Document library

G-MODMAN II features:

- Compatible with ARINC 791 antenna systems
- Rugged and durable
- Integrated Web UI
- Open architecture system via OpenAMIP and OpenBMIP support
- Simple Network Management Protocol (SNMP) to help manage and monitor antenna performance
- Near real-time monitoring and logging allows easy access to performance and troubleshooting data
- Separate processor available for system monitoring or traffic management
- Support Portal includes Help Desk, terminal document library and configurator for easy setup and 24/7 support
- Meets standard safe-to-fly requirements
- Meets DO-160G and MIL-STD-810G requirements (G-MODMAN II ATR)
- Rack-mount chassis or ARINC 404A with AC (1 RU) or 28VDC power input
- Combine with Black ICE for flexible waveform integration

G-MODMAN OPEN PLATFORM (OP)

G-MODMAN OP is a complementary offering to G-MODMAN II that addresses special customers' mission requirements for diverse SATCOM services spanning both commercial and military/government networks. It is as a turn-key solution that integrates multiple modems/services with a single antenna.

With G-MODMAN OP, users can seamlessly switch between commercial and military networks within the same mission, delivering always-on availability, capacity, coverage and capability. In addition to autonomous switching, it has a Remote Application Programming Interface (RAPI) as well as a WebUI that allow manual modem/service switching, thus enabling the user to have complete control over how the mission is run.

G-MODMAN OP is natively capable of switching between the G-MODMAN product family and the iDirect 9800 AR/AE airborne satellite router.

Contact us for more information or to ascertain if a particular modem is compatible with G-MODMAN OP: inmarsatgov.com/contact/.

G-MODMAN OP features:

- Autonomous service switching
- Modem Independent Received Signal Strength Indicator (RSSI) for closed loop pointing
- MIL-STD-188-164 compliant 10 and 50 MHz oscillators
- Supports up to three external modems (including G-MODMAN) and one antenna
- Like G-MODMAN, G-MODMAN OP is available in two form factors: 19" 1 RU rack mount and ARINC-404A

TABLE 1: G-MODMAN II RU AND OP SPECIFICATIONS FOR ALL MARKETS

Size / Weight		14lbs, 1 RU 21.25in Deep
Power		100W (Max), 28VDC and 85-240VAC, 50-400Hz
Operating Temperature	MIL-STD-810H, Methond 502.5, Procedure II MIL-STD-810H, Methond 501.5, Procedure II	-20°C to 60°C
Storage Temperature	MIL-STD-810H, Methond 502.5, Procedure I MIL-STD-810H, Methond 501.5, Procedure I	-40°C to 85°C
Altitude	MIL-STD-810H, Methond 500.5, Procedure III	45,000ft
Rapid Decompression	MIL-STD-810H, Methond 500.5, Procedure III	8,000ft to 45,000ft in less than 15sec
Explosive Atmosphere	MIL-STD-810H, Methond 511.5, Procedure I	40,000ft @ +60°C
Vibration	MIL-STD-810H, Methond 514.6, Procedure I	2hrs per axis, 3 axes
Acceleration	MIL-STD-810H, Methond 513.6, Procedure I	Longitudinal: 9.0g forward, 1.5g aft, Lateral: 1.5g right/left, Vertical: 8.0g down, 4.0g up (Sustained loading for 6sec duration)
Radiated Emissions	MIL-STD-461G	RE102; Electric Field: 10kHz to 18GHz
Conducted Emissions	MIL-STD-461G	CE102; Power Leads: 10kHz to 10MHz

TABLE 2: G-MODMAN II ATR ENVIRONMENTAL SPECIFICATIONS FOR U.S. GOVERNMENT UAS MARKET

Size / Weight		15.25 x 7.64 x 4.88in, 16.5lbs
Power Consumption		45W Typical @ 28VDC 88W Maximum @ 28VDC
Power Input	MIL-STD-704F	LDC101 and LDC102, 28V
Voltage Spike	MIL-STD-704F	LDC105, 28V
Ground Operating Temperature	RCTA/DO-160G 4.5.2 (Low) RCTA/DO-160G 4.5.4 (High)	-40°C to +60°C with forced air cooling (Starts at -55°C, fully operational at -40°C)
Ground Survival Temperature	RCTA/DO-160G 4.5.1 (Low) RCTA/DO-160G 4.5.3 (High)	-55°C to +85°C
Lightning Induced Transient Susceptibility	DO-160G Section 22	Level 3 (Antenna connection). Level 2 (Data and signal connections)
Rapid Decompression	RCTA/DO-160G 4.6.2	8,000ft to 55,000ft in < 15sec
Electro Magnetic Interference	MIL-STD-461G	CE101, CE102, RE101, RE102
Electrostatic Discharge	MIL-STD-464C, Section 5.8.4	8K Volt direct and 15K volt via air - Personnel Contact - All accessible points (does not include direct pin injection behind connector covers) procedure per Section 5.8.4.
Explosive Atmosphere	MIL-STD-810H, Method 511, Procedure I	40,000ft @ +60°C
Aggravated Humidity	MIL-STD-810H, Method 507, Procedure II	10 cycles, operational checks after cycles 5 and 10
Fungus	MIL-STD-810H, Method 508	28 days exposure
Waterproofness	MIL-STD-810H, Method 506 Procedure I	Rainfall Rate: 4"/hr Wind Velocity: 40mph 30min per side (not operating)
Sand and Dust	MIL-STD-810H, Method 510, Procedure I	Procedure I, Blowing Dust Internal Equipment
Salt Spray	MIL-STD-810H, Method 509	96 Hours
Random Vibration	MIL-STD-810H, Method 514, Procedure I	Category 13 (Operational, Propeller Aircraft). Internal (avionics bays) , L0 = 0.10, f0 =81Hz,4.57 Grms (MQ-9), 4 hours/axis
Operational Shock	MIL-STD-810H, Method 516, Procedure I	20g, 11 ms, Sawtooth
Crash Safety Shock	MIL-STD-810H, Method 516, Procedure V	40g, 11ms, Sawtooth
Electrical Bonding	MIL-STD-464C, Section 5.11	Cable Shields to EUT Enclosure: <15mΩ EUT Enclosure to System Structure: <10mΩ

TABLE 3: G-MODMAN II ATR AND OP SPECIFICATIONS FOR COMMERCIAL AND NON-U.S. GOVERNMENT MARKETS
PER RECOMMENDED DO-160G ENVIRONMENTAL REQUIREMENTS FOR TARGET AIRCRAFT

SECTION 4	**Temperature**	CATEGORY F2	Non-pressurized, non-temperature controlled location up to 55,000ft
SECTION 4	**Altitude**	CATEGORY F2	Non-pressurized, non-temperature controlled location up to 55,000ft
SECTION 5	**Temperature variation**	CATEGORY A	Equipment internal to the aircraft, temperature change rate 10°C per minute
SECTION 6	**Humidity**	CATEGORY B	Severe Humidity Environment - Zone not environmentally controlled
SECTION 7	**Operational shocks and crash safety**	CATEGORY B, E	Standard and low-frequency operational shock and crash safety
SECTION 8	**Vibration**	CATEGORY S, R	Standard vibration (Fixed Wing Turboprop), Robust vibration (Fixed Wing Turbojet and Turbofan)
SECTION 9	**Explosive atmosphere**	CATEGORY E	Not hermetically sealed and not contained in a case to prevent flame and explosion propagation
SECTION 10	**Waterproofness**	CATEGORY R	Equipment location where it may be subjected to a driving rain or water sprayed on it from any angle
SECTION 11	**Fluids susceptibility**	CATEGORY F	Hydraulic fluids, de-icing fluids, insecticides, disinfectant, soda and coffee susceptibility
SECTION 12	**Sand and dust**	CATEGORY S	Equipment location subjected to blowing dust and sand
SECTION 13	**Fungus resistance**	CATEGORY F	Environment that is exposed to severe fungus contamination
SECTION 14	**Salt fog**	CATEGORY S	Equipment location subjected to a corrosive atmosphere
SECTION 15	**Magnetic effect**	CATEGORY A	Equipment location ≥ 1m from magnetic compass or flux gates
SECTION 16	**Power input**	CATEGORY Z	28 VDC equipment used on all variations of aircraft electrical systems
SECTION 17	**Voltage spike**	CATEGORY A	Equipment installation for which a high degree of protection against damage by voltage spikes is required
SECTION 18	**Audio frequency conducted susceptibility**	CATEGORY Z	28 VDC equipment used on all variations of aircraft electrical systems
SECTION 19	**Induced signal susceptibility**	CATEGORY ZC	Equipment requiring interference-free operation on constant frequency or DC electrical systems
SECTION 20	**Rf susceptibility (radiated and conducted)**	CATEGORY RR	Equipment with high criticality and requiring Transmitting-Portable Electronic Device (T-PED) Tolerance
SECTION 21	**Emission of radio frequency energy**	CATEGORY M	Equipment and interconnected wiring located where apertures are electro-magnetically significant
SECTION 22	**Lightning induced transient susceptibility**	CAT A2K2L3	Equipment and interconnecting wiring installed in a moderately exposed environment
SECTION 25	**Electrostatic discharge (ESD)**	CATEGORY A	Electronic equipment that is operated during normal operations and/or maintenance of the aircraft
SECTION 26	**Fire, flammability**	CATEGORY C	Enclosures housing electronics in pressurized or non-pressurized zones and non-fire zones

G-MODMAN II LITE

G-MODMAN II LITE supports military and government operations that increasingly rely on UAS for a range of Command and Control (C2) and Intelligence, Surveillance and Reconnaissance (ISR) missions where low terminal SWaP, reliable high throughput and ease of installation and integration are core to their operations.

Suited for UAS platforms demands, G-MODMAN II LITE pairs with low SWaP user terminals and integrates onto a small-size UASs, enabling high data rates in both directions via the Global Xpress worldwide network.

It includes the Support Portal and Help Desk to enable fast integration, easy configuration and rapid issue resolution.

G-MODMAN II LITE features:

- Weights 6.05 lbs. – crucial for integrating onto small UASs
- Same core functionality as G-MODMAN II, with a nearly identical interface to the end user
- Integrated iDirect iQ800
- Graphical User Interface (GUI)
- Integrated switch with one data port
- Monitoring and logging capabilities

TABLE 4: G-MODMAN II LITE

Size		14.94” x 7.5” x 1.72”
Weight		6.05 lbs.
Power Consumption	MIL-STD-704F	51W Typical @ 28VDC 65W Maximum @ 28VDC
Operating Temperature	RTCA/DO-160G 4.5.2 RTCA/DO-160G 4.5.4	-40°C to +71°C
Storage Temperature	RTCA/DO-160G 4.5.1 RTCA/DO-160G 4.5.3	-55°C to +85°C
Altitude	RTCA/DO-160G 4.5.2	40,000 ft
Rapid Decompression	RTCA/DO-160G 4.6.2	8,000 ft to 55,000 ft in less than 15 seconds
Explosive Atmosphere	MIL-STD-810G, Method 511.5, Procedure I	40,000 ft @ +71°C
Vibration	MIL-STD-810G, Method 514.6, Procedure I	4 hours per axis
Salt Spary	MIL-STD-810G, Method 509.5	96 total hours
Shock	MIL-STD-810G, Method 516.6, Procedures I and IV	
Dust	MIL-STD-810G W/Change 1, Method 510.6, Procedure I	
Fungus	MIL-STD-810G, Method 508.6	28 days
ESD	MIL-STD-464C	8K Volt direct / 15K volt via air
Lightning	RTCA/DO-160G, 22	Level 3 antenna, level 2 connections

G-MODMAN LAND

G-MODMAN LAND is the latest innovation in our suite of G-MODMAN technologies. Similar to its aero counterparts, G-MODMAN LAND is built to suit land expeditionary users' requirements. A lightweight, flexible and easy-to-use solution, it is designed to seamlessly integrate with existing antenna systems and provide the enabling technology to support implementation of current and future generations of Global Xpress services and land user terminals. The solution is designed to be rated to military standards, including MIL-STD-810H, MIL-STD-461G and IP66 or higher.

G-MODMAN LAND customers will have access to the same robust system, high-fidelity monitoring and logging features, including debugging and alarming of terminals remotely and in near real-time to quickly bring users back into operation. Monitoring data is stored and can be accessed at later points for up to one year to evaluate past performance and trend analytics.

ABOUT GLOBAL XPRESS

In U.S. Government operation since July 2014, Global Xpress is an end-to-end high-throughput commercial Ka-band network from that provides worldwide service. It brings the benefits of seamless, consistent wideband access that meets mobile, interoperable communication needs, at an affordable price. Global Xpress' next generation will bring a further five payloads scheduled to launch by 2025, delivering directly on customer demand with velocity and agility. These new satellites will also be backwards compatible with existing Global Xpress terminals.

Innovation Built To Meet Government-Specific Requirements

We recognize the critical role of innovative and cost-effective products and services on mission success and can rapidly build solutions tailored to users' unique requirements. That is why Viasat Government focuses on the development of flexible and dependable technologies and solutions—such as G-MODMAN II ecosystem—that maximize proven and often already adopted capabilities by Programs of Record. When users have to mobilize, they know and trust that our satellite services will be there – no matter where the mission takes them.