

SMARTSAT **Satellite Monitoring** solutions

monitor

strategic and tactical interception



..... In today's challenging environment, Government agencies need to monitor conversations and data transmitted over satellite communications networks. Whilst most satellite communications are perfectly legitimate, the extensive geographical coverage provided by satellite networks means they are favoured by subversive groups located in remote regions or those wishing to avoid fixed wire network interception.

L-3 TRL's **SMARTSAT solutions** enable government and security agencies to passively monitor the Thuraya, Inmarsat, IsatPhone and VSAT satellite communications networks without network interference. Our solutions include data mining and tracing software, enabling the comprehensive analysis and reporting of target activities to counter threats as they arise.

Our SMARTSAT solutions offer coverage on a regional or national scale with flexible, fully upgradeable systems that can maximise the monitoring capability for our customers. Whether the requirement is to monitor activity across an entire network, identify and locate specific terminals of interest or to intercept call content, each SMARTSAT solution can provide non-intrusive monitoring and interception throughout the life of the requirement.

Strategic systems

..... Our strategic systems provide a passive monitoring capability covering an extensive geographic area. High performance, flexible, modular and upgradeable, our solutions provide effective monitoring of voice, fax, high-speed data links and calls.

Our complete strategic solutions include all associated site surveys, installation, testing and customer training required to provide a complete turnkey capability.

A typical strategic system includes:

- Antenna and RF system including a C-band antenna
- Demodulator subsystem – for the monitoring of all calls in the area covered by the main installation
- Control and analysis subsystem – including server computers and analysis workstations with control and analysis software
- Additional remote L-band outstations as required to extend full duplex monitoring and interception
- Comprehensive training programs – for Operators, Maintainers and Administrators, held at the customer premises or at L-3 TRL
- Full warranty and support



monitoring the remotest regions



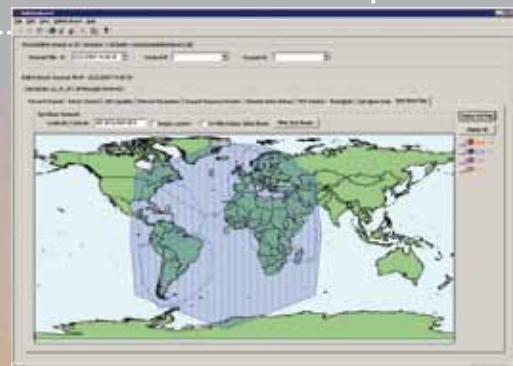
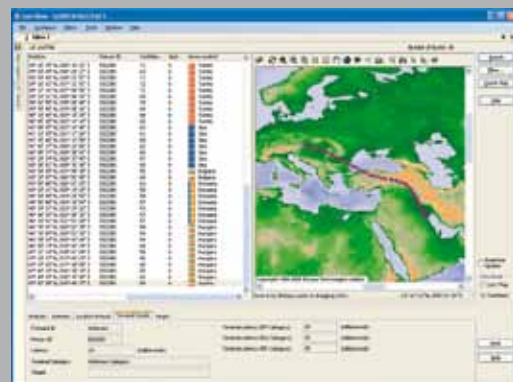
Inmarsat Monitoring System (IMS)

For monitoring agencies that require a flexible, turnkey solution for monitoring the Inmarsat network, the SMARTSAT Inmarsat Monitoring System (IMS) enables the passive monitoring and recording of voice, fax and data communications; offering full duplex call monitoring, content extraction and optional geo-location facility to locate and track targets.

IMS can be used to target all activity across the Inmarsat satellite network, specific terminals of interest or users of the following Inmarsat services:

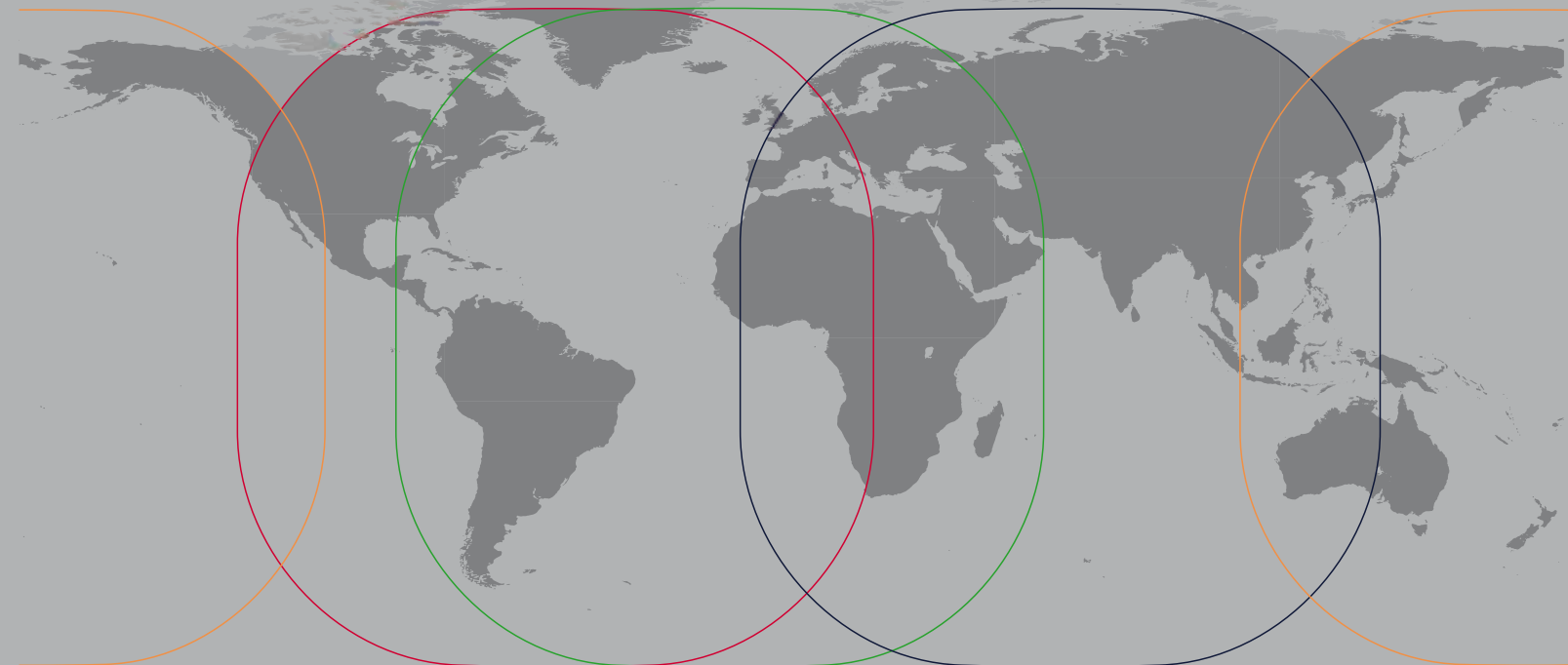
- Inmarsat B
- Inmarsat D
- Inmarsat F 55
- Inmarsat M
- Inmarsat GAN
- Inmarsat C
- Inmarsat F 33
- Inmarsat F 77
- Inmarsat Mini M
- Swift 64

The IMS solution can cater for spot beam operations and is fully compatible with the Inmarsat-3 and Inmarsat-4 satellites.



The Inmarsat network

Utilising a number of geo-stationary satellites, Inmarsat provides a wide global coverage including the Pacific, Atlantic East, Atlantic West and Indian Ocean regions. Originally intended for maritime communications, the Inmarsat network has evolved to cater for a wide range of users including marine, aeronautical and land-based, using both fixed and mobile terminals.



Inmarsat Coverage Key

Pacific Ocean Region

Atlantic Ocean Region-West

Atlantic Ocean Region-East

Indian Ocean Region

Comprehensive call monitoring

In addition to recovering call content (voice, data or fax), the SMARTSAT IMS can also provide specific information about the call, such as numbers dialled, start and end times, call originators and areas contacted. This call information can be recorded for further analysis to build a detailed picture of specific communications to and from terminals of interest.

A full intelligence picture

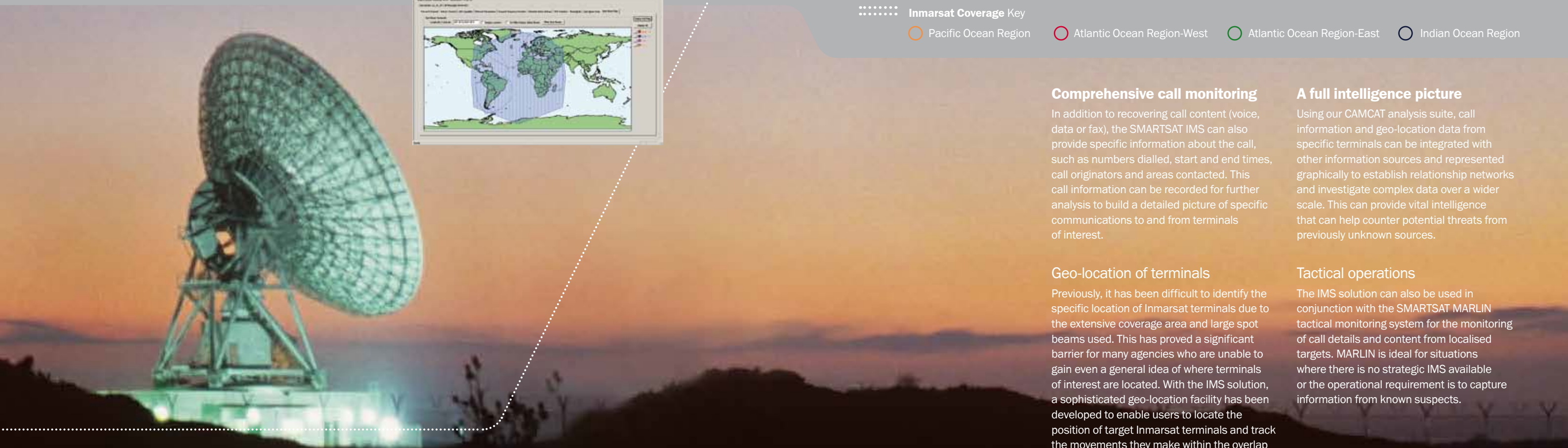
Using our CAMCAT analysis suite, call information and geo-location data from specific terminals can be integrated with other information sources and represented graphically to establish relationship networks and investigate complex data over a wider scale. This can provide vital intelligence that can help counter potential threats from previously unknown sources.

Geo-location of terminals

Previously, it has been difficult to identify the specific location of Inmarsat terminals due to the extensive coverage area and large spot beams used. This has proved a significant barrier for many agencies who are unable to gain even a general idea of where terminals of interest are located. With the IMS solution, a sophisticated geo-location facility has been developed to enable users to locate the position of target Inmarsat terminals and track the movements they make within the overlap area of two Inmarsat satellites.

Tactical operations

The IMS solution can also be used in conjunction with the SMARTSAT MARLIN tactical monitoring system for the monitoring of call details and content from localised targets. MARLIN is ideal for situations where there is no strategic IMS available or the operational requirement is to capture information from known suspects.





IsatPhone Monitoring System (ISMS)

L-3 TRL's IsatPhone Monitoring System (ISMS) offers a complete solution for the passive monitoring and interception of the IsatPhone network on both a strategic and tactical level. Using C-band and L-band monitoring, the ISMS can provide national and regional coverage for the monitoring of IsatPhone, FleetPhone and LandPhone terminals.

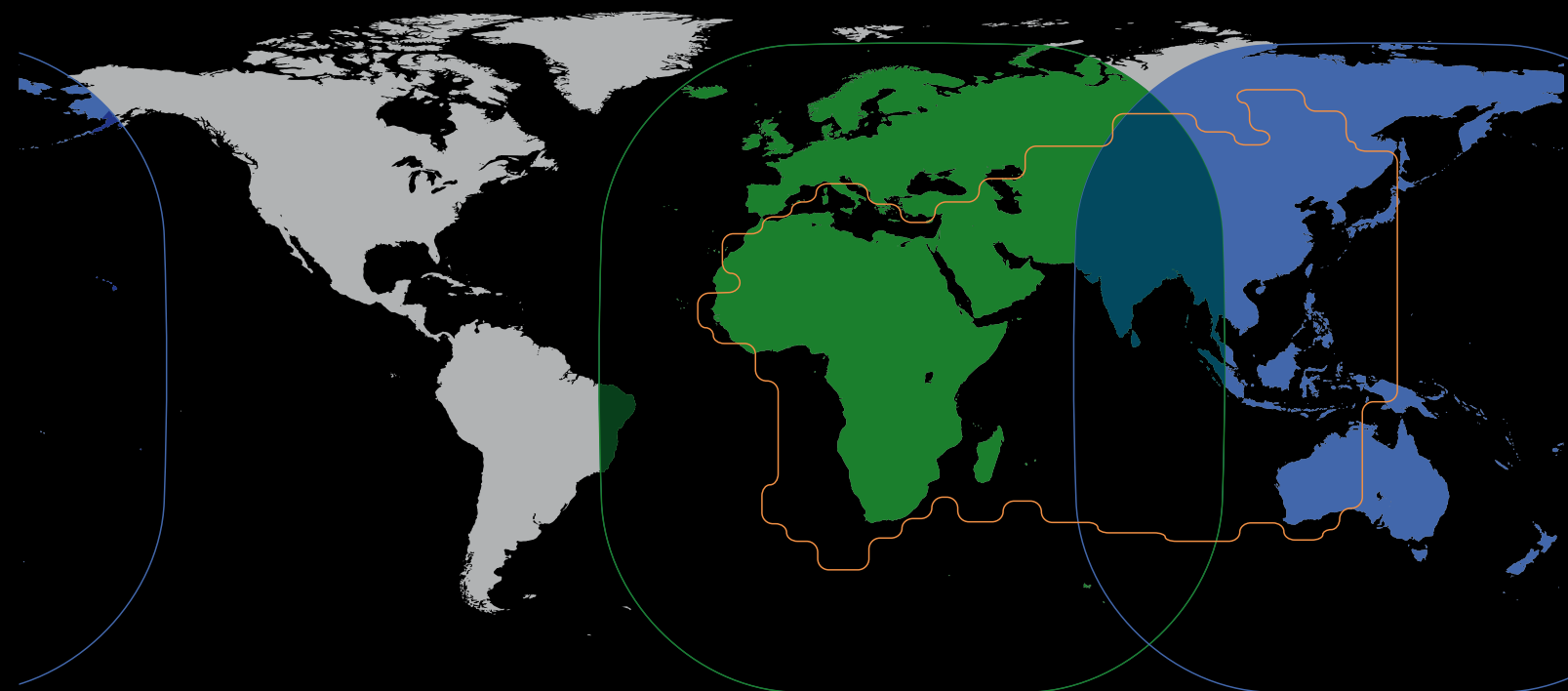
In addition to call content, the ISMS solution can provide information on the date and time of call, the numbers dialed as well as the call originator. The system can also provide the interception of fax and data transmissions.

Call ID	Time	Originator	Destination	Duration	Status	Notes
1001	10:00	1234567890	0987654321	00:01	Success	
1002	10:05	1234567890	0987654321	00:01	Success	
1003	10:10	1234567890	0987654321	00:01	Success	
1004	10:15	1234567890	0987654321	00:01	Success	
1005	10:20	1234567890	0987654321	00:01	Success	
1006	10:25	1234567890	0987654321	00:01	Success	
1007	10:30	1234567890	0987654321	00:01	Success	
1008	10:35	1234567890	0987654321	00:01	Success	
1009	10:40	1234567890	0987654321	00:01	Success	
1010	10:45	1234567890	0987654321	00:01	Success	
1011	10:50	1234567890	0987654321	00:01	Success	
1012	10:55	1234567890	0987654321	00:01	Success	
1013	11:00	1234567890	0987654321	00:01	Success	
1014	11:05	1234567890	0987654321	00:01	Success	
1015	11:10	1234567890	0987654321	00:01	Success	
1016	11:15	1234567890	0987654321	00:01	Success	
1017	11:20	1234567890	0987654321	00:01	Success	
1018	11:25	1234567890	0987654321	00:01	Success	
1019	11:30	1234567890	0987654321	00:01	Success	
1020	11:35	1234567890	0987654321	00:01	Success	
1021	11:40	1234567890	0987654321	00:01	Success	
1022	11:45	1234567890	0987654321	00:01	Success	
1023	11:50	1234567890	0987654321	00:01	Success	
1024	11:55	1234567890	0987654321	00:01	Success	
1025	12:00	1234567890	0987654321	00:01	Success	



The IsatPhone network

After merging with ACeS in 2006, Inmarsat launched the IsatPhone service in 2007 which now provides telecommunications coverage for Asia, Africa and the Middle East. Using small, lightweight terminals, the IsatPhone service uses the Inmarsat-4 satellites to provide a large coverage area.



..... Coverage for IsatPhone, LandPhone & FleetPhone Key
 ○ Service coverage ● 1-4 EMEA ● 1-4 Asia-Pacific

Retrieve call information

Providing full, duplex call interception and monitoring for all calls passing through a spotbeam of interest, the ISMS solution can be used to retrieve call content from specific terminals of interest to gather vital intelligence on known targets. For a broader view, the ISMS can also be used to monitor all IsatPhone call activity across the Inmarsat-4 satellite for future analysis.

Comprehensive analysis

The ISMS system can be combined with L-3 TRL's CAMCAT graphical analysis software to provide a comprehensive investigative solution that can aid in breaking down complex data and establishing inter-relationships between terminals of interest. Data from other sources can also be integrated into this software suite to develop actionable intelligence on developing situations.

Tactical monitoring

The rapidly deployable SMARTSAT MARLIN system can be used with the ISMS solution to provide the effective monitoring and interception of localised targets within radio line-of-sight. Also operating as a passive monitoring system, MARLIN can be easily transported to the theatre of operations where there is no strategic ISMS available.

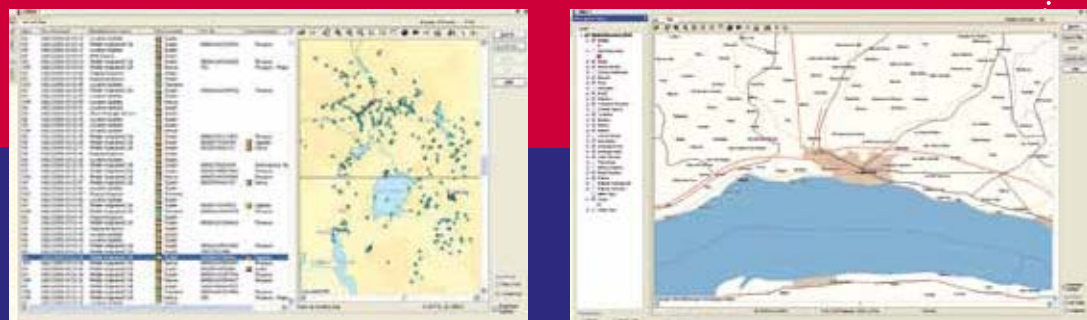




Thuraya Monitoring System (TMS)

The SMARTSAT Thuraya Monitoring System (TMS) enables monitoring agencies to passively intercept voice, SMS, fax and data communications on both a strategic and tactical level.

The TMS solution can provide full duplex call monitoring for voice communications of specific terminals of interest in addition to monitoring all activity across the Thuraya network.



The Thuraya network

The Thuraya network provides telecommunications coverage for areas of Europe, Africa, the Middle East and Asia, with the Thuraya-3 satellite extending this to areas of the Far East, South East Asia, China and Australasia. The Thuraya service is particularly attractive to those living or travelling in remote or rural areas where there is limited terrestrial infrastructure.



THURAYA Coverage Key



Thuraya-2 Satellite coverage



Thuraya-3 Satellite coverage

Duplex interception and monitoring

The SMARTSAT TMS can recover call content from voice, SMS, fax and data transmissions as well as provide specific information about the call, such as numbers dialled, start and end times, call originators, GPS location of handset and areas contacted. This call information can be recorded for further analysis to build a detailed picture of specific communications to and from terminals of interest.

Dynamic tracking of targets

The TMS system enables monitoring agencies to dynamically track terminals of interest by monitoring all activity across the Thuraya satellite; indicating areas of activity outside of the existing TMS coverage and recovering information on calls related to the target terminal. This functionality can be scaled according to operational requirements from a single spot beam, to as many as is required.

Actionable intelligence

As with all our SMARTSAT solutions, the TMS can be used with our CAMCAT graphical analysis software suite to integrate information from a variety of sources for examination and analysis. Complex network relationships can be established and presented in a comprehensive format to develop actionable intelligence and provide a broader overview on developing situations.





VSAT Monitoring System (VMS)

Due to the complexities of most VSAT systems, each SMARTSAT VSAT Monitoring System (VMS) is developed in collaboration with our customers to provide a bespoke solution that is specifically tailored to their individual requirements. Each VMS solution enables monitoring agencies to analyse, classify and monitor VSAT networks of interest – for both existing and evolving services.

Tailored for you

The SMARTSAT VMS offers:

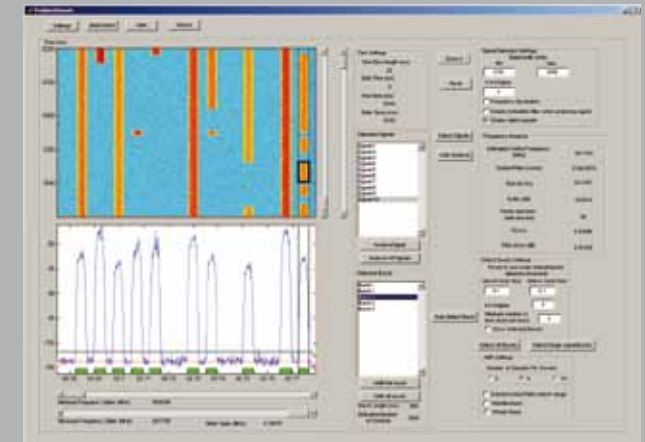
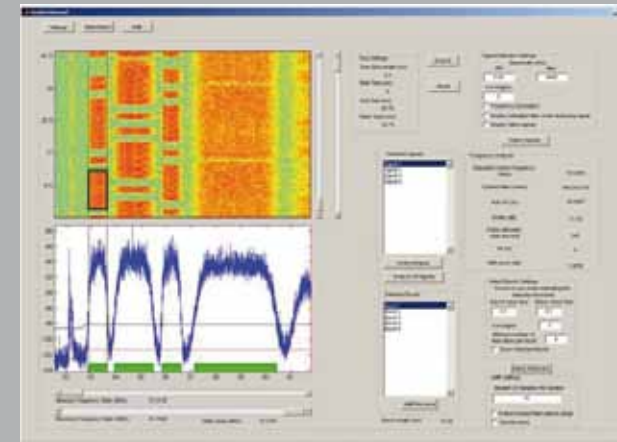
- Satellite survey tools – to help identify the VSAT networks of interest
- Signal and protocol analysis – to enable off-air identification of the network and traffic types
- Flexible and scalable design – that will grow as the extent of VSAT monitoring increases
- Call content recovery

Each VMS solution provides a highly capable and expertly tailored monitoring capability both in terms of technical performance and expertise within our customers' organisation.

We offer a cooperative solution that effectively builds customer capability.

VSAT networks

Very Small Aperture Terminals (VSATs) use a number of satellites in geo-synchronous orbit to communicate via a series of complex networks. Predominantly used to transmit Broadband data to remote or rural locations, VSAT networks utilise wireless links that are completely independent of the terrestrial infrastructure. The use of VSAT systems are popular where there is limited terrestrial services available and quick installation is needed for a large coverage area.





MARLIN

SMARTSAT MARLIN is a rapidly deployable system for the monitoring of localised targets within tactical environments. Used to passively monitor communications over the Inmarsat, IsatPhone or Thuraya satellite networks, MARLIN cannot be detected by either the mobile user or the satellite network, making it ideal for covert operations.

MARLIN can intercept up to 6 calls simultaneously within radio line-of-sight of the target terminal; recording information on the called and calling parties along with the geographical location (depending on service type and network). Monitoring agencies are able to control the system via an intuitive Windows-based GUI which can display incoming calls in real-time, play-back voice calls and display a number of fax, SMS and data transmissions via a laptop PC.

The MARLIN system is small, portable and lightweight and can be easily transported to the theatre of operations in a single suitcase or heavy duty transit case accepted by commercial airlines worldwide. Quickly deployable and operational in around 5 minutes, MARLIN is suitable for use in land, sea and air applications.



Comprehensive user interface

The MARLIN GUI has been designed for ease of use; with data presented in either list or map view depending on service type and user preference. The laptop PC supplied for control of the MARLIN system is connected to the unit via an Ethernet connection.

Utilising standard Windows conventions, the GUI provides the rapid and clear presentation of call data and content, whether voice, SMS, fax or data. The system decodes and extracts emails and Internet activity sessions in addition to decoding other frequently used protocols. Intercepted calls and call related information can be filtered according to the range of criteria for rapid identification of calls or mobile terminals of interest. The GUI also enables rapid configuration of the system prior to deployment.

Variable attenuation

MARLIN is supplied with 2 flat-plate antennas and cables for quick and easy deployment. One antenna is required to capture the satellite downlink while the second (target) antenna captures the signal transmitted by the mobile terminal.

A range of antennas for a variety of deployment scenarios can be supplied by L-3 TRL, including vehicle mounted and omnidirectional variants. The system also features variable attenuation to allow effective operation under a wide range of signal conditions typically experienced in the tactical environment.



tactical monitoring



Added peace of mind

We are committed to providing versatile solutions that can evolve as targets change and technologies advance. A key component in providing this solution is having the best equipment to meet the operational requirements of our customers that will deliver the desired technical capability. All our SMARTSAT solutions include full warranty and support alongside comprehensive training programmes that enable our customers to maximise the efficiency of their systems.

World-class training solutions

Our dedicated training team can offer the perfect balance between analysing your training needs, designing comprehensive training programmes and delivering them effectively to help develop customer best practice. Our strategic alliances across the industry and wealth of in-house expertise provides us with the knowledge and experience to deliver high quality training that is aligned with the latest developments in satellite communications technology.

Support throughout the lifecycle

To ensure our SMARTSAT systems maintain optimum performance throughout the life of the requirement, our support packages have been designed to provide our customers with the complete solution from the moment of delivery. We offer a range of services including upgrades, repair, obsolescence management and trend analysis combined with our Customer Support Helpdesk which ensures our customers get the very best after-sales service. In addition, L-3 TRL can also provide bespoke customer support programmes, designed exclusively for their exact requirements.



the complete solution

L-3 TRL Technology protects people worldwide from current and ever-evolving threats through market leading defence solutions.

Since 1983, we have designed, developed and delivered a range of innovative, high-technology solutions in Intelligence, Surveillance and Reconnaissance (ISR), Force Protection and Information Assurance to governments and defence agencies.



For more information

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