

Satellite Monitoring System

Capture, demodulate and, decode multi-service mobile satellite systems data to track and monitor hostile assets

Vehere IntelliWorker SM is a multiservice Satellite Monitoring System which is a portable and tactical unit for monitoring Thuraya, Iridium and IsatPhone Pro consolidated in the same system.

It is designed for interception of traffic and control channels of Thuraya mobile satellite system (standard GMR-1), Iridium mobile satellite system, and IsatPhone Pro mobile satellite system (standard GMR-2+).

The system has a unified monitoring mode. It allows for the target creation of a Mobile Earth Station (MES) for monitoring. It has an advanced recording system with alerts to notify the beginning & end of registration service and voice messages of the targeted MES.

IntelliWorker SM System forms an imperative part of Vehere Tactical System which contributes significantly towards communication interception and logging. It is a comprehensive solution that performs monitoring and sorting of communications from Thuraya, Iridium and IsatPhone PRO satellite phones operational within user designated spot beams.

System Functionality - Monitoring and Analysis

The capability of Multiservice Satellite Monitoring System is appended in succeeding paragraph.

Thuraya Mobile Satellite System

The Thuraya network adheres to the GEO-Mobile Radio (GMR-1) standard and provides satellite telephony for most of Europe, the Middle East, North, Central and East Africa, Asia and Australia. It has two satellites viz Thuraya 2 (98.5E)

KEY BENEFITS

Deliver a comprehensive multi-services tactical monitoring over L-band to trace and track adversaries.

Decipher, Decode and, analyze content in satellite communication to improve space situational awareness.

Characterize spectrum and use inbuilt signal analysis tools to uncover hidden insights in unknown signals.

Automatically detects most satellite constellations, generates enriched metadata for faster analysis to provide real-time intelligence.

and Thuraya 3 (44E). Thuraya Mobile Satellite Monitoring System is a sub system of Multiservice Satellite Monitoring System that enables monitoring of Thuraya network with the following functionalities.

- Interception of the home spot beam and adjacent 3 spot beams (home cluster) for the full available traffic i.e. 32 call per spot beam. The number of spot beams may be increased to 5 in case of low traffic conditions
- Traffic interception of L-band satellite phone uplink in the line of sight (25 kilometers according to terrain and urban area). The system is capable of monitoring only downlink if uplink is not available
- Automatic association of intercepted traffic in a duplex pair in terms of both uplink and downlink availability
- Registration of low speed data transmit service (up to TCH9 in the absence of subscriber encryption) and processing with extracting semantic content for standard protocols TCP (HTTP/Web-mail, POP, SMTP, FTP, IMAP4, TFTP, TELNET, AOL, MSN, ICQ etc.) and UDP (RTP etc).
- System automatically detects and monitors Voice, SMS and Fax communication.
- The system automatically decrypts the Voice, SMS and Fax communication almost in real time (once the call is completed).
- Coverage area can be changed by the operator according to the priority of intelligence mission.
- The location of the target can be mapped on Digital map.
- The Thuraya Monitoring System has a unique field for adding call synopsis.
- The system has the possibility of multiple users accessing the system for call playback.

Iridium Satellite System

Iridium Satellite Network is a satellite-based wireless personal communications network designed to permit any type of telephone transmission – voice, paging, facsimile or data – to reach its destination anywhere on Earth. Iridium Satellite Monitoring System is a sub system of Multiservice Satellite Monitoring System that is designed for automatic passive interception of uplink and downlink of Iridium satellite network. It intercepts and records the traffic channel information in real time and has the following functionalities.

- Traffic interception of the Iridium satellite, which is in the home region for the system location. Interception of the neighbor satellites is possible due to the channel capacity.
- Traffic interception of L-band satellite phone uplink in the line of sight (25 kilometers according to terrain and urban area). The system is capable of monitoring only downlink if uplink is not available.
- Automatic association of intercepted traffic in a duplex pair in terms of both uplink and downlink availability.
- Registration of low speed data transmit service and processing with extracting semantic content for standard protocols WIN-S, ENDLOGINVER, USER LOGIN, AHEAD, 21HEX, PPP, SkyFile.com, Body.uc, Header.uc, GWM, HZL, ONLINE, ARC, START in absence of subscriber encryption.
- Independent reception of up to 32 physical channels.
- Decoding (extraction of packets, demultiplexing, descrambling, deinterlacing, removal of a convolutional code) of digital streams.

- Processing of the received segments and commands for the purpose of identification in received streams of the beginning/ending of sessions.
- Transcoding of voice messages in a wave format.
- Classification of the selected sessions by types of a useful load (speech, fax messages, data transmission, symbolical messages).
- Managing databases (DB) of the saved sessions.
- Selection of DB sessions by plural attributes and parameters.
- Final processing of sessions by records from a DB on the operator workstation with preparing reports.

IsatPhone PRO Mobile Satellite Services

IsatPhone Pro Satellite Monitoring System is a sub system of Multiservice Satellite Monitoring System that has the following functionalities

- Interception of the home narrow spot beam and up to one neighbouring narrow spot beam for the any downlink transmission.
- Traffic interception of L-band satellite phone uplink in the line of sight (25 kilometres according to terrain and urban area). The system is capable of monitoring only downlink if uplink is not available.
- Automatic association of intercepted traffic in a duplex pair in terms of both uplink and downlink availability.
- Automatic demodulation, decoding, descrambling, determine and registration of voice and SMS, transmitted by IsatPhone PRO system.
- The ability to sort and select the content database by date, time, duration of conversation and other secondary characters, as well as the ability to copy selected messages in the media

Data Handling and Management

The multiservice System captures and archives voice (audio files) and other communication media in the database, for effective retrieval and playback at later stage and maintains a dedicated storage platform as a File Storage Server. It ensures passive usage of databases without affecting the functionality of the system.

| | Parameter | Forward Channel | Reverse Channel |
|---------------|-----------------------|----------------------------------|----------------------------------|
| Thuraya GMR-1 | Voice | Yes | Yes |
| | SMS | Yes | Yes |
| | Data transfer (TCH9) | Yes | Yes |
| | Data transfer (GmPRS) | No (Channel capacity constraint) | No (Channel capacity constraint) |
| | Fax | No (Channel capacity constraint) | No (Channel capacity constraint) |
| | Position | No (Not transmitted) | Yes |
| | IMSI | No (Not transmitted) | Yes |
| | Caller number | Yes | Yes |

| | Parameter | Forward Channel | Reverse Channel |
|---------------|--------------------------------|----------------------|-----------------|
| Thuraya GMR-1 | IMEI | No (Not transmitted) | Yes |
| | TMSI | Yes | Yes |
| | Voice | Yes | Yes |
| | SMS | Yes | Yes |
| | Data transfer (low speed data) | Yes | Yes |
| | Fax (low speed data) | Yes | Yes |
| Iridium | Position | Yes | Yes |
| | IMSI | No (Not Transmitted) | Yes |
| | Caller Number | Yes | Yes |
| | IMEI | No (Not Transmitted) | Yes |
| | TMSI | Yes | Yes |
| | Voice | Yes | Yes |
| IsatPhone PRO | SMS | Yes | Yes |
| | Position | No (Not Transmitted) | Yes |
| | IMSI | Yes | Yes |
| | Caller Number | Yes | Yes |
| | IMEI | No (Not Transmitted) | Yes |
| | TMSI | Yes | Yes |

ABOUT VEHERE

Vehere builds intelligent and active solutions for real time Cyber Situational Awareness which forms the core component of Enterprise Cyber Defense and Homeland Security. Harnessing the power of advanced Big data Analytics, Artificial Intelligence (AI) and Machine Learning (ML), Vehere's Cyber Situational Awareness solutions have acquired a high level of efficiency, to effectively reduce the risk of a breach and to proactively defend against threats.

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