SATCOM FOR NATIONAL SECURITY & INTELLIGENCE GATHERING

ST Engineering

The SIGINT (Signal Intelligence) or COMINT (Communications Intelligence) applications, and the monitoring and processing of satellite traffic, are integral elements of national security activities in order to preserve the political, economical and social freedoms, rights and values of a country.

Each bit of intelligence that can anticipate acts of terrorism, international agreement violations or man-made disasters is critical to protect a nation and its inhabitants. Intelligence and national security agencies need to have the best performing equipment with the widest range of demodulation and decapsulation options to process video, data and voice traffic over satellite in full detail.

With ST Engineering iDirect, the acquired data remains untouched in the process of demodulation in order to preserve the integrity of the original content.

ST Engineering iDirect provides the highest performance receivers in the market for data, video and voice satellite traffic monitoring and processing.

DIALOG

SCPC MODEMS

powered by Newtec iDirect

Best-of-Trade COTS Satcom Receivers

ST Engineering iDirect has a track record of satellite communication equipment installations within national security and intelligence gathering applications around the globe. Our satcom receivers are appreciated by the diverse intelligence agencies due to their performance, quality and broad spectrum of modulation standards and options.

ST Engineering iDirect has over 30 years experience of delivering satellite solutions to markets such as broadcast (TV & radio), VSAT (consumer and enterprise), IP trunking, IP backhaul (voice, data and video) as well as government and defense applications over satellite. This rich experience is translated in Our portfolio of satcom products and technologies to meet the highest operational requirements for professional reliability and service availability.

For intelligence gathering, ST Engineering iDirect provides solutions for both Single Channel per Carrier (SCPC) links as well as VSAT networks that work independent of satellite constellation or frequency band.

ST Engineering iDirect's IP broadband hub and terminals

MDM9000 MODEM (DEMOD FUNCTION)

- DVB-S2/S2X + S2 Extensions
- Modulation up to 256 APSK
- Baud rate range: 1 – 72 MBaud
- Data rates up to 425 Mbit/s
- ASI + IP (GSE decapsulation, raw BBF)
- Intelligence gathering features
- Detecting hidden traffic

EL970 SATELLITE DEMODULATOR

- DVB-S2 and DVB-DSNG/S compliant
- QPSK, 8PSK, 16APSK and 32APSK (with short frames)
- Data rates up to 155 Mbps
- Intelligence features

NTC-2263 DVB SATELLITE RECEIVER

- DVB-S2 and DVB-DSNG/S compliant
- QPSK, 8PSK, 16APSK and 32APSK (with short frames)
- ASI + IP + serial LVDS + SPI + HSSI + G.703
- NSA Approved in US

Fit for Data Gathering

ST Engineering iDirect satcom receivers are typically installed in intelligence gathering centers. A defined procedure will allow for data exchanged over satellite to be read out. After the receivers get the command to lock on a satellite carrier, intelligence gathering operators can determine the center frequency of the carrier by using a satellite signal analyzer. The results will allow operators to check what modulation standard and symbol rate are used in the satellite carrier. Finally the Base Band frames can be analyzed and useful intelligence data gathered out of both transport streams (TS) and generic streams (GS).

During the entire operation, our receivers will not touch the integrity of the original content and allow detailed processing of the acquired intelligence.

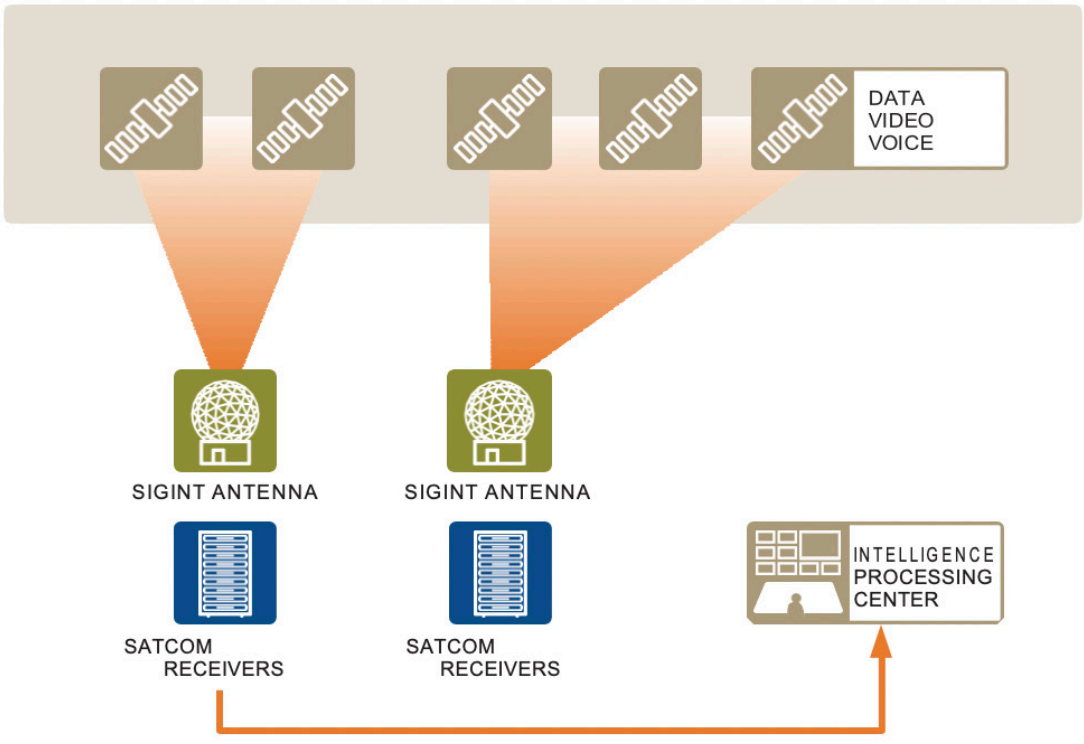
In the MDM9000 modem some specific features for intelligence gathering were included in order to detect and capture hidden data in regular satcom transmissions such as:

- Cyclic Redundancy Check (CRC8) Handling
- Data Frame Length Handling

Our product portfolio contains a variety of modulation and demodulation equipment for standard and proprietary communication over satellite for data, video and voice supporting protocols such as DVB-S2X, DVB-S2, DVB-S, DVB-DSNG, DVB-S2 Extensions, MF-TDMA 4CPM, Mx-DMA, Reed Solomon, Viterbi, TPC and LDPC.

The DVB receivers cover the full spectrum of MODCODs up to 256APSK (including 32APSK short frames) as well as CCM/ VCM/ACM modes and data rates from 1.2 kbps to 425 Mbps. The MODCODs are combined with a set of encapsulation/decapsulation methods such as MPE, XPE, GSE, ULE, Base Band Frame and Data Piping.

Our satcom receivers support the richest variety of modulation, coding, data rate and encapsulation methods in the market.



Based on DVB Standards for Interoperability

ST Engineering iDirect has always been a pioneer in satellite technology and was at the base of many DVB satellite communication standards available in the market today. Kick-started by ST Engineering iDirect, key players in the satellite industry recently called for a satellite transmission standard to extend the DVB-S2 standard. DVB-S2X was launched in March 2014 and approved by both DVB and ETSI.

The full implementation of both the DVB-S2X and DVB-S2 standards are already available on our 6000-series modems and receivers.

Open standards such as DVB-S2 and DVB-S2X allow for interoperability and avoid vendor lock-in. Today, DVB-S2X already provides gains of up to 51% when compared with DVB-S2. The support of Wideband technology adds another 20% to the equation. These gains exceed the results by proprietary systems in the market.

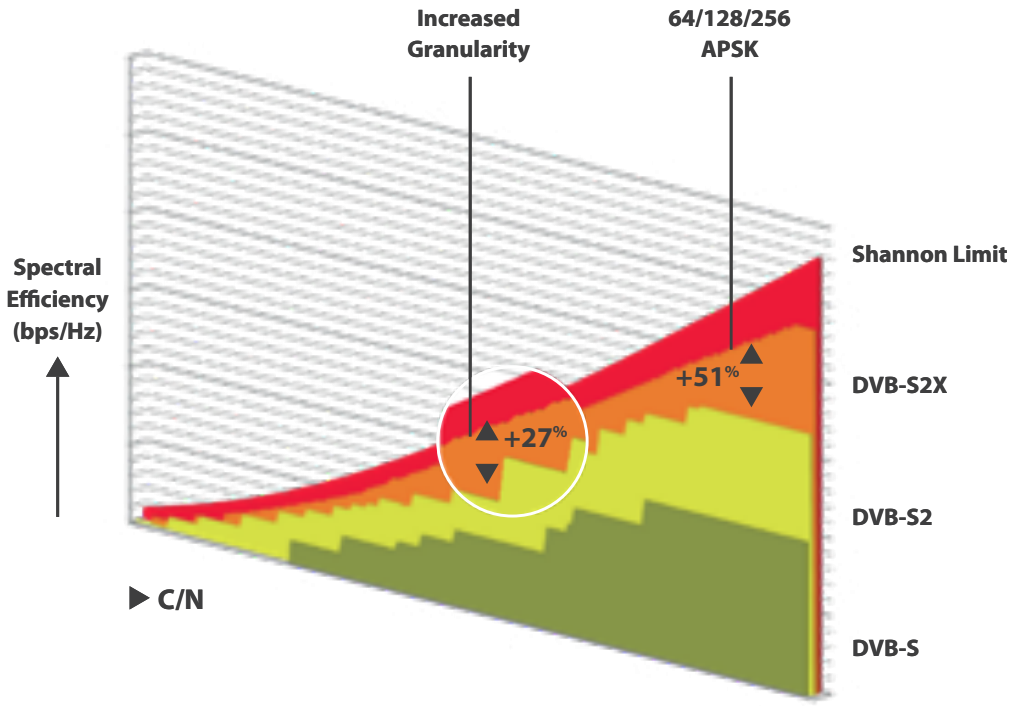


Figure 2: DVB-S2X Standard Improvements

10 Improvements in DVB-S2X

- Smaller Roll-Offs
- Advanced Filtering of Satellite Carriers
- Increased Granularity in MODCODs
- Higher Order Modulation: 64/128/256 APSK support
- Linear and Non-linear MODCODs
- Better Implementation of MODCODs
- Wideband Support
- Very Low SNR Suppot for Mobile Applications
- Channel Bonding
- Additional Standard Scrambling Sequences to Mitigate Co-Channel-Interference (CCI)

Maintaining Integrity of Original Content

Getting all the information available out of the satellite carriers is very important for intelligence gathering agencies. Small details can provide precious information vital to their objectives.

In the process of acquisition and demodulation of a satellite signal the raw data remains untouched as PID-filtering and data handling activities can be switched off in our receivers (no filtering of MAC-addresses).

All 8192 possible PIDs are transparently passed through for further processing.

The original Transport Streams and Generic Streams are not modified, maintaining the integrity of the original content. Our receivers also operate in a mode where the complete carrier is demodulated and have raw Base Band data as output that can be further processed by intelligent engines.

Possibility to switch off data handling and PID filtering activities (no MAC-address filtering) in the receivers to keep the integrity of the original data.

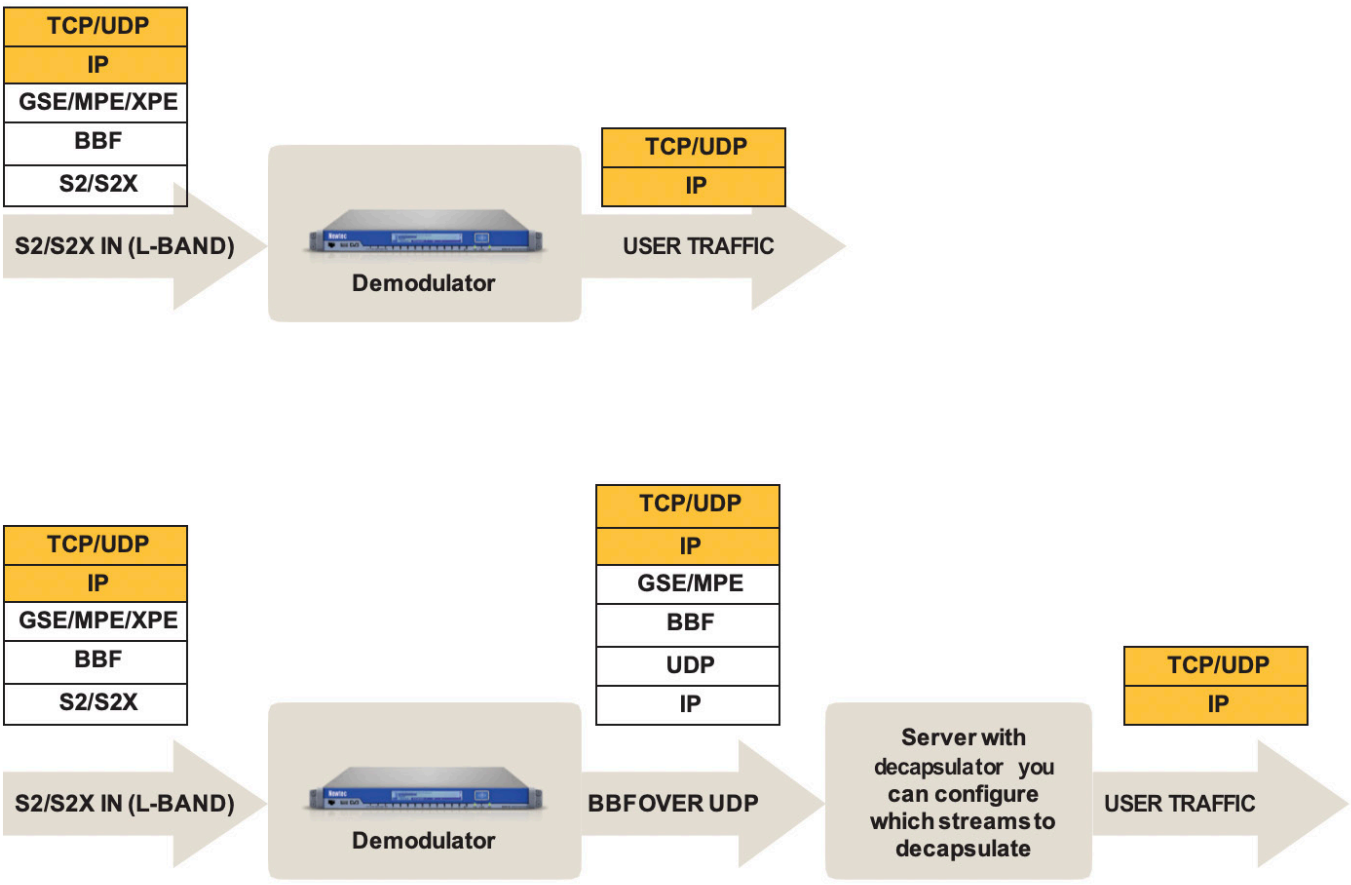


Figure 3: DVB-S2/S2X interception multistream and single stream with one ST Engineering iDirect receiver

Our VSAT Broadband Solutions

ST Engineering iDirect has a large base of installed VSAT systems worldwide. Our VSAT broadband systems are already reaching hundreds of thousands of consumer households today in Europe, Africa, North and South America, Middle East as well as Asia. Other VSAT installations are used in enterprise, SCADA as well in SME, SOHO and government and defense networks.

The broadband platform is Dialog® multiservice VSAT solution. The Dialog platform mainly targets enterprise, broadcast, backhaul and government and defense applications.

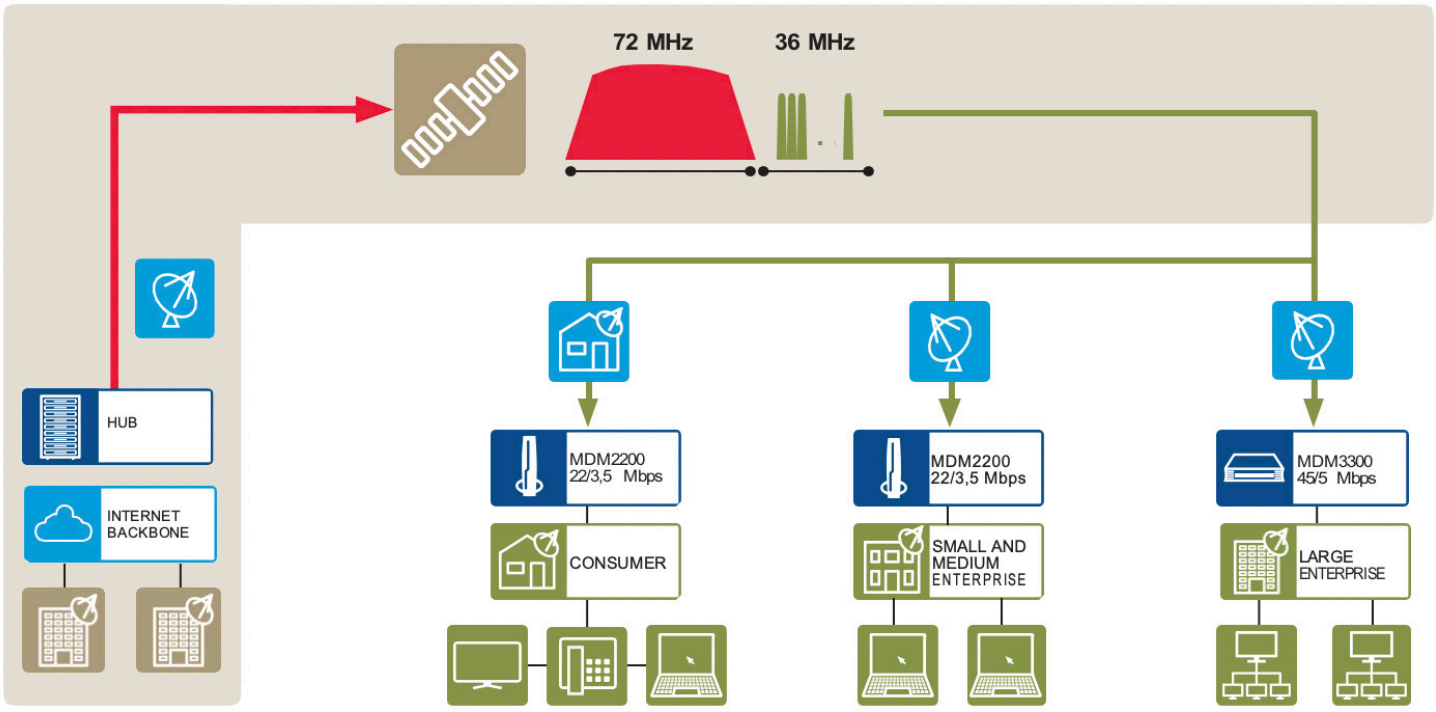


Figure 4: VSAT Intelligence Gathering

Interception of VSAT IP Broadband

The ST Engineering iDirect VSAT platforms typically consist of a hub infrastructure, remote modems or terminals and a Network Management System (NMS) that manages the entire satellite network.

For the forward satellite link from the hub towards the remote, the DVB-S2 modulation standard with efficiency enhancing extensions are used (smaller roll-offs, etc.). These can be intercepted by our DVB receivers.

The satellite return channel from the remotes to the hub depend on ST Engineering iDirect platform in use. Both the Newtec Dialog and Sat3Play platforms have MF-TDMA 4CPM technology on board (closely linked to DVB-RCS2). The Dialog platform extends the satellite return channel with SCPC (DVB-S2 with Extensions, HRC) and Mx-DMATM (Cross-Dimensional Multiple Access) alternatives. As such, the satellite service provider has the choice between three different return channels depending on the application, throughput requirements and service offering.

For the interception of the return channels a combination of hub, modem and NMS infrastructure is required. As such, the scheduling, return carrier pools and return capacity groups typical to MF-TDMA can be simulated to receive the requested data that can be forwarded for further processing.

ST Engineering iDirect

ST Engineering iDirect
VSAT hub range

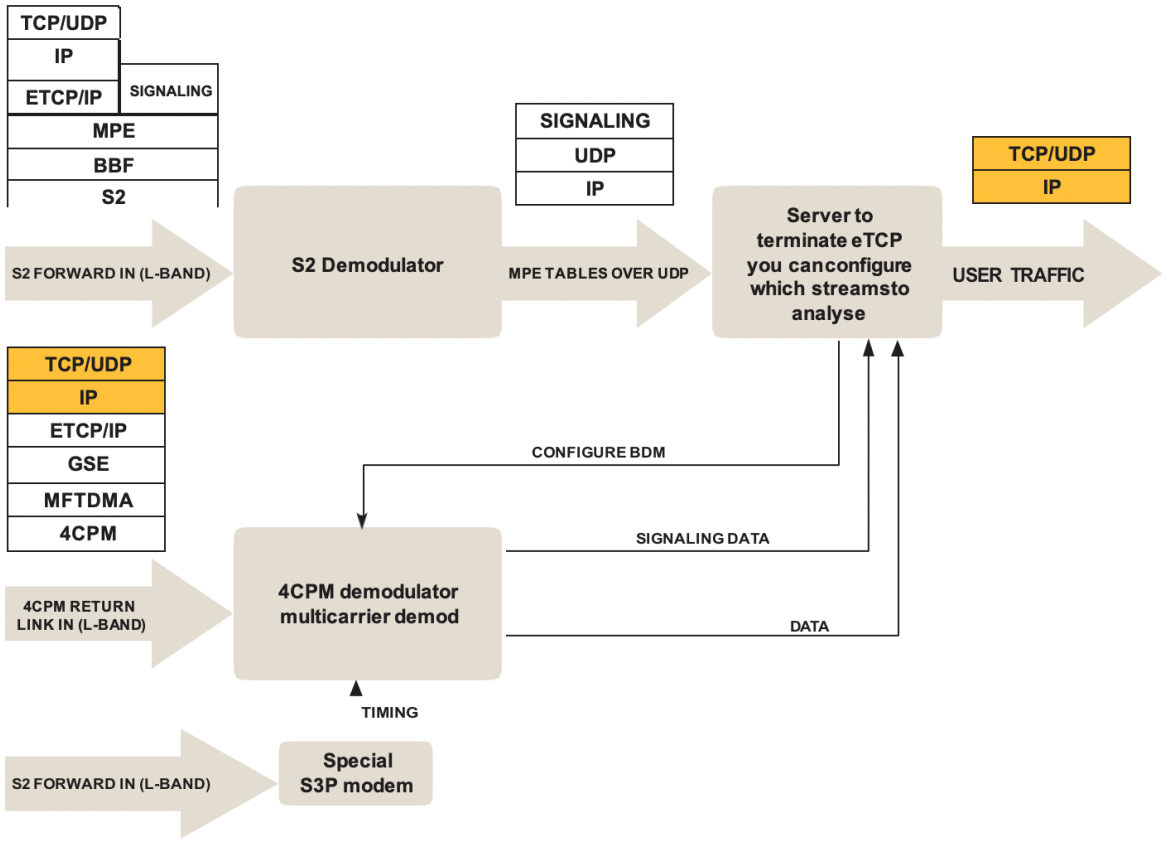


Figure 5: DVB-S2/S2X interception multistream and single stream with one receiver