

# Border Security Networks over Satellite

Soldier Mod talks to Koen Willems, Market Director Government, Defense & Mobility Satcom, Newtec



**K**oen Willems has more than 15 years' experience working in different technology industries. Before joining Newtec he was Product Marketing Manager for Europe at the electronics giant TOSHIBA. At Newtec, Koen has been involved in many successful product launches linked to IP modems and related innovative satcom technology as Product Marketing Manager. Currently Koen holds the position of Market Director with focus on the Government, Defense and Mobility satcom markets.

Koen has a Master's degree in English & Scandinavian Languages (University Ghent, Belgium, 1997) and a Master's degree in Marketing Strategy and Management (Vlekhoe Business School in Brussels, 1998). You may know Koen as a Newtec technology evangelist through his regular appearance in editorials in satellite focused publications, white papers and speaking slots at conferences around the world.

## Q: What are the challenges for setting up a border security system nowadays?

**A:** Border security networks have high priority on the political agenda of different nations. Recent events, such as the border conflicts in Jemen, Iraq, Ukraine and migration issues in the Mediterranean Sea or at the US border, are only a few examples where border security plays an important role. When securing borders, governments have the difficult task of protecting their nation from threats such as terrorism, illegal trade, crime and immigration pull and push factors.

Setting up an effective border security system comes with a set of challenges which relate to a country's geography and economy, the identified threats on a border and the nation's policy on dealing with these threats. Brazil, for example, has 10 neighboring countries with 16,885 km of border and a coastline stretching over 7,491 km. Furthermore, when considering a border control system, the Brazilian government has to deal with a wide geographical diversity, including the Amazon rainforest, the Andes mountain ranges and deserts.

Overcoming these challenges and running an effective border security policy can only happen when linking processes, technologies and organizational structures through an integrated program with all entities involved in border security, such as border/immigration agencies, police, customs and national security. Access to a common data set that is updated at regular intervals at each point of intervention is a key feature for modern-day border security management. Satellite will always be an inherent part of such a strategy.

## Q: What is the role of satellite for border security networks?

**A:** Border security and satellite technology are closely linked. Earth observation, surveillance and communications in border security programs rely heavily on satellite. Satellite-based earth observation and surveillance systems help to monitor and report movement in areas of a country along the border which are more remote due to terrain conditions, ►

- ▶ like mountain ranges, sea, tropical forest or climate factors, including desert or thinly populated regions.

Meanwhile, satellite communications allow border security authorities to exchange information or access critical data from headquarters, border checkpoints or on-the-move border patrol units. In this scenario, Satcom will be used as a primary or secondary communication channel. When the border checkpoint or gate is located in an area that is well provisioned with terrestrial communications, the Satcom solution will function as a back-up system to make sure the exchange of mission-critical data remains fully available – even when natural or man-made disasters strike or the terrestrial infrastructure is temporarily unreliable. When border patrol units are on-the-move (land/sea/air) or border gates and ground surveillance systems are installed in remote locations, it is more than likely that satellite will be the primary communication channel.

**Q: How to embrace the increasing complexity of border security satellite networks?**

**A:** With the increased complexity of threats, conflicts and accelerated global immigration, governments will take on multi-level border security programs looking to respond to different challenges but at the same time facilitate legitimate access. When deploying a satellite communications platform for a border security system a wide variety of services and applications need to be taken into consideration, such as surveillance data relay and exchange, internet access, communications-on-the-move, video conferencing, biometric information and office applications for administrative and logistic purposes.

The combination of these services and applications will improve the efficiency of border security operations. However, the deployment of bandwidth-consuming sensor technologies and the increased throughput of video, data and voice traffic over satellite put pressure on available satellite bandwidths, as well as on allocated budgets for border security. The complexity of border security operations calls for a comprehensive, flexible and all-encompassing Satcom platform that can take care of different applications, services and traffic types. The satellite platform needs to embrace the complexities that come with border security operations, such as mobility, service availability, stringent budgets and more data, but also needs to be able to maximize efficiency in order to respect budgets and make the most of throughput.

**Q: How to increase the efficiency of border security satellite networks?**

**A:** In the border security ecosystem a satellite network must take multiple applications into account, as well as technologies, services, agencies and stakeholders that need to interact. To match the challenges and complexities of border security operations over satellite, Newtec offers an innovative multiservice platform called Newtec Dialog®. This multi-purpose satellite VSAT platform is highly scalable and

flexible and allows border security agencies to build and adapt their infrastructure according to the operations at hand. From a central hub, the border security network can be deployed on multiple satellites in C-, Ku-, Ka- or X-band. Newtec Dialog will give border security authorities the power to support different services and applications while making hassle-free decisions on which technology to use.

**Q: How will the Newtec Dialog Multiservice VSAT Platform benefit border security networks?**

**A:** The Newtec Dialog platform is built around three core concepts that have been executed all the way through the architecture, the supporting technologies and the implementation of the VSAT platform. These core concepts are Flexibility, Scalability and Efficiency. They can easily be translated towards the everyday border security operational reality.

Border security operations call for high flexibility to respond to changing environments, threats and daily interventions. Newtec Dialog is built for flexibility and will help authorities embrace changing environments. The flexibility of the system is reflected in the ability to support multiple applications, services, traffic types and waveforms. The network can be tailored, according to different application requirements, through the bandwidth management and advanced hierarchical Quality of Service tools inside Newtec Dialog. The type of remote modem or terminal that is connected to the Newtec Dialog hub inside the border security headquarters can also be adapted according to the service or application (modem, terminal or OEM modem board). In addition, Newtec Dialog is independent of satellite frequency and constellation. As such, the satellite network infrastructure can easily be groomed towards another satellite if operational elements change towards a new conflict area in another part of the country or if contracts with satellite operators or service providers change.

The Newtec Dialog platform can be used for an existing satellite-based border security network or can grow as more structural border security elements are put in place. The platform scales to every type of satellite network: from a small network with few remotes and a single service, up to the very largest with multi-service capabilities. It can also be scaled from single coverage to multi-spot, multi-gateway High Throughput Satellite (HTS) networks. The Newtec Dialog platform hub hardware, license structure and technology elements enable low up-front CAPEX investment. As such, the satellite network can initially be deployed on 'hotspots' along the border and gradually be extended by adding remotes at checkpoints, surveillance sensors or airborne platforms. Throughput rates can also be added, as well as services including video, data, voice and different traffic types.

Meanwhile, the efficiency technologies featured on the Newtec Dialog platform provide the border security agency with the extra bandwidth above border regions that

▶ have limited satellite coverage. Furthermore, additional throughput will be achieved within the same bandwidth, giving agencies the chance to increase their network with extra services or extra remotes. As such, ambitious border security programs can still be achieved within tight government budgets. Depending on the application, service and amount of terminals in the network Newtec Dialog can combine different waveforms – MF-TDMA, SCPC and Newtec’s Mx-DMA™ – connecting to the same hub. The Newtec Mx-DMA return technology incorporates the best features of MF-TDMA and SCPC technologies, solving the difficult choice of selecting one or the other. SCPC-like efficiencies are reached whilst maintaining the MF-TDMA-like bandwidth allocation flexibility. Compared to other technologies in the market, Mx-DMA runs in a seamless dynamic mode and does not switch between MF-TDMA and SCPC, which typically results in packet and performance loss.

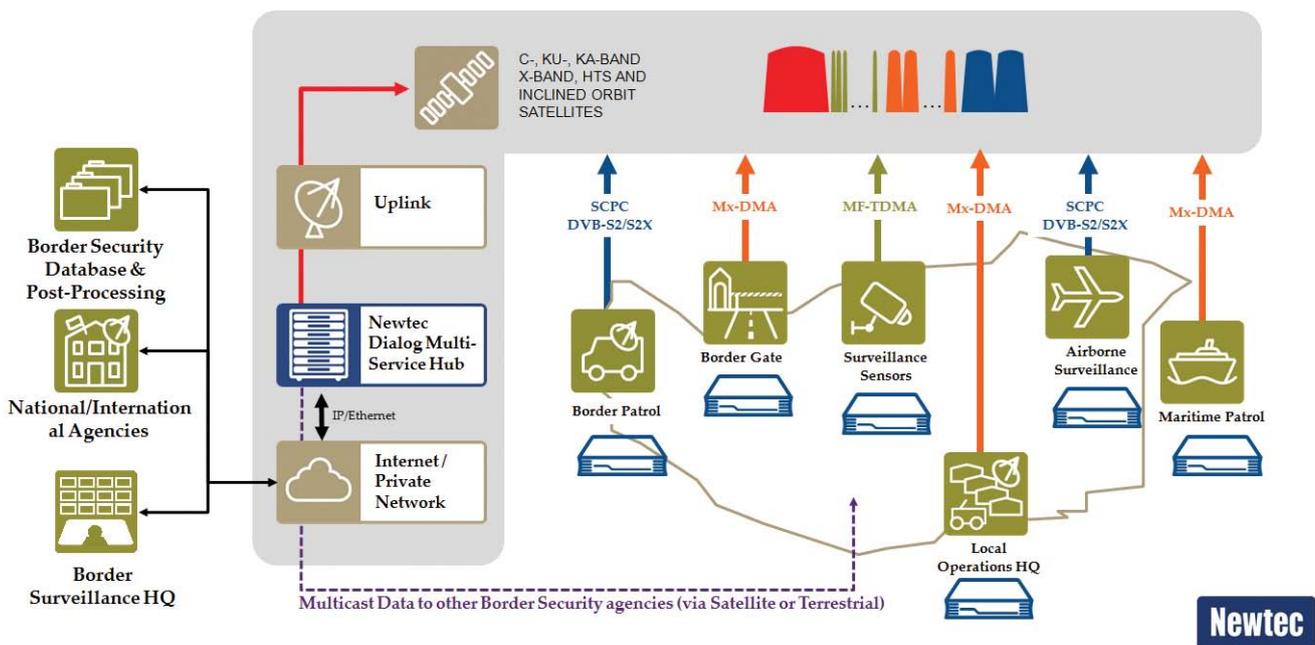
traffic without losing data. The unique and auto-adaptive technology incorporated inside Newtec’s FlexACM takes care of any fading condition in order to avoid link or data losses. Fading conditions need to be considered with Ka-, Ku-, X-band frequency bands, with operations over HTS or Inclined Orbit Satellite. Other factors which could lead to fading effects can be environmental (rain and dust), as a result of shadowing effects (mobility) or from interference between two adjacent satellites. FlexACM ensures these will no longer interrupt satellite conditions.

In short, Newtec Dialog will give border security agencies the peace of mind to focus on their core tasks with a scalable and efficient multiservice VSAT platform that embraces the changes and challenges that go hand-in-hand with border security operations over satellite. ■

**Q: How does Newtec Dialog increase the service availability for mission critical links inside a border security network?**

**A:** As well as throughput efficiency, Newtec Dialog also ensures service availability to increase the effectiveness of border security operations by integrating the well-known and field-proven FlexACM® technology. Even in harsh and hostile conditions it is important that satellite links are available to exchange mission-critical border security

VSAT NETWORK ARCHITECTURE: MULTISERVICE BORDER SECURITY



Translating the Newtec Dialog Multiservice VSAT Platform to a Border Security Network over satellite.